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PART. II

FEDERAL COMMUNICATIONS COMMISSION

■

RADIOTELEGRAPHY IN MARITIME SERVICES

Changes in Frequencies, Operation Procedures, Technical Standards and Other Criteria

Title 47—Telecommunication

CHAPTER I—FEDERAL COMMUNICATIONS COMMISSION

[Docket No. 20813; FCC 77-380]

RADIOTELEGRAPHY IN MARITIME SERVICES

Changes in Frequencies, Operation Procedures, Technical Standards and Other Criteria

AGENCY: Federal Communications Commission.

ACTION: Report and Order to amend Commission's Rules and Regulations as necessary to comply with treaty requirements.

SUMMARY: Amends Parts 2, 81 and 83 to implement changes in frequencies, operating procedures, technical standards and other criteria relating to the use of radiotelegraphy in the maritime services adopted at the ITU World Maritime Administrative Radio Conference, Geneva, 1974.

EFFECTIVE DATE: July 18, 1977.

ADDRESS: Federal Communications Commission, Washington, D.C. 20554.

FOR FURTHER INFORMATION CONTACT:

Walter E. Weaver, Aviation and Marine Division, Safety and Special Radio Services Bureau (202—632-7197).

SUPPLEMENTARY INFORMATION:

Adopted: June 2, 1977.

Released: June 10, 1977.

By the Commission: Commissioner Quello absent.

In the matter of amendment of Parts 2, 13, 81 and 83 to implement changes in frequencies, operating procedures, technical standards and other criteria relating to the use of radiotelegraphy in the maritime services adopted at the ITU World Maritime Administrative Radio Conference, Geneva, 1974; *Report and Order* (Proceeding terminated). (41 FR 32434.)

1. The Commission released its Notice of Proposed Rule Making (FCC 76-455) in the instant proceeding on June 4, 1976, which was published in the FEDERAL REGISTER on June 15, 1976 (41 FR 24155). By its Order printed in the FEDERAL REGISTER on August 3, 1976 (41 FR 32434), the Commission granted an extension of time in which to file comments. The dates for filing comments and replies have passed.

2. Comments were filed by the American Commercal Barge Line Company (ACBL); American Institute of Merchant Shipping (AIMS); Collins Division of Rockwell International Corporation (Collins); Communications Associates, Inc. (CAI); ITT Mackay Marine (Mackay); ITT World Communications, Inc. (Worldcom); Mobile Marine Radio, Inc. (MMR); and Scientific Radio Systems, Inc. (SRS). No reply comments were filed.

3. CAI and Mackay in their comments provide an overview of the proposed rule amendments set forth in the Notice of Proposed Rule Making with which we heartily agree and believe should be brought to the attention of interested persons:

CAI: "* * * A review of marine communications over the last decade indicates a dramatic increase in usage. There are more users, there is more communication per user, there are completely restructured frequency assignments, and there is a marked change in the shipping industry's attitude toward their communication needs. Add to this the changes being brought about in the international political scene, past, present and future. Each of these factors continues to increase at an increasing rate making it highly probable the rise in marine communication, and the need for more change, over the next five years will substantially surpass the last five * * *."

4. CAI and Collins provide strong supportive comments in regard to the use of frequency synthesizers, as follows:

CAI: "* * * A marine communication philosophy predicated upon the use of synthesizers in the h.f. band is apparent, as well as reasonable. The technology is not new. Other services have been using synthesizers for twenty years. The popularity of synthesizers now dominant in marine v.h.f. transmitters is considerable, especially when it is considered that v.h.f. synthesizers were first proposed in 1968 and first introduced in 1971. Today the use of synthesizer technology for marine v.h.f. and h.f. communications is an accepted technique by most planners.

"The use of synthesizers does provide an additional degree of complexity and expense. This, however, is the inevitable price to be paid for accommodating more users and more communications in an inexpandable spectrum space.

"The obvious advantage, of course, is the availability of any of the authorized frequencies such that all of the services available to a voyager are truly available * * *. There are other justifying advantages as well. The ability to transmit immediately from a cold start in the event of an emergency is very important, when it is recognized that often frequencies other than those allocated to distress are used for this purpose. AMVER traffic being an example. And, of course, frequency stability is in itself almost all the justification that is needed. Many of the communication problems encountered in the marine service can be traced directly or indirectly to a lack of frequency stability."

Collins: "Technology, well within the state-of-the-art, is available to meet the technical performance requirements proposed by the Commission in this proceeding without presenting an unreasonable economic burden.

"Specifically, when considering equipment requirements to utilize the available 924 A1 and 338 F1 emission channels, the economics involved clearly indicate the use of frequency synthesizer systems, in lieu of individual crystal control on each of a number of channels. The use of such synthesizer systems is further indicated considering future changes in frequencies that are likely to occur * * * in connection with future ITU actions. A corollary benefit with synthesizer techniques is that greatly improved frequency precision and stability and, hence, tolerance can readily be achieved economically * * *."

5. In their comments ACBL notes that provision was not included in the Notice of Proposed Rule Making for operation of narrow-band direct-printing on the inland and intracoastal waterways, and requests that such provision be included in the rules. The license records for the public coast station at Jeffersonville, Ind. (WFN) show that radio-teletypewriter (narrow-band direct-printing) was initiated on a developmental basis during 1970 and has continued to the present time. We are sympathetic to the continuation of WFN use of narrow-band direct-printing, however, we feel that rule amendments to provide for this usage on a regular basis should be handled as a separate rule making proceeding. We are not, therefore, disposing of ACBL's request in this proceeding. We are making changes to the proposed § 81.204(c) to provide for requirements specified by the Government subsequent to release of the Notice of Proposed Rule Making. The changes to § 81.204(c) affect stations KFS, WAX, WLO, and WSL. Section 81.204(c), as amended, is set forth below.

6. AIMS comments that it is established procedure of many shipping companies to have a public coast telegraph station transmit a fleet call each day to have their vessels report positions, etc. Further, that there are cases when vessels of a single licensee may need to intercommunicate and therefore would need a common channel. AIMS expresses the view that under the proposed assignment of working frequencies there will no longer be a common working channel for all ships of a given licensee. We believe that proposed § 83.319(b) is fully self-explanatory in regard to which radiotelegraph working frequencies may be used by ship stations. Further, this section provides adequate flexibility to permit both of the types of operation referred to by AIMS. For communications other than the two types mentioned by AIMS, we expect the ship radiotelegraph station to comply with the basic intent of the International Telecommunication Union here involved. ITU's intent is to spread usage of the working frequencies evenly between the using ship stations. The objective of this is to avoid a bunching of ship stations on a relatively few frequencies, which would result in interference and disruption of communications. In order to do this, we have assigned two series numbers of working frequencies to each radiotelegraph station.

7. Mackay expresses the view that the action proposed in paragraph 25 of the Notice of Proposed Rule Making "discontinue consideration of transmitters such as the 2013, ET8065, and similar types" might be interpreted to mean any transmitter that uses frequency multipliers. Mackay requests that the intent be clarified for the benefit of transmitter designers. To provide the requested clarification, we refer interested persons to our intent as set forth in paragraph 25 of the Notice of Proposed Rule Making which, briefly summarized, was that transmitters using the harmonic relationship scheme of operation would not be acceptable on new ships or as new replacement transmitters on existing ships.

8. In this proceeding we are strongly recommending that ship stations, pur-

suant to 1974 WMARC Resolution Mar. 2–4, employ a frequency synthesis generator(s), in lieu of discrete crystals, as a means of providing capability to operate on all of the frequencies and to improve the frequency stability of the transmitter. We are not, however, requiring the use of a synthesizer or that a vessel be fitted with all frequencies. Ship operators will, however, be expected to fit those frequencies needed for whatever routes its vessels travel. This would include calling channel series Nos. 5 and 6 and the necessary group calling channels to establish communication over the areas traversed, as well as the necessary working channels, intership channels, channels as may be required for communication with Government stations, and other necessary frequencies to fulfill the objectives of Resolution A.283 of the Intergovernmental Maritime Consultative Organization (IMCO).

9. Frequency tolerance applicable to transmitters currently installed aboard ship. It is clear that the existing tolerance specified in Part 83 (.005 percent or 60 ppm) will not assure, for the bands 6, 8, 12, 16 and 25 MHz, that the A1 carrier will be maintained within the 500 Hz channel spacing adopted by the 1974 WMARC, as set forth in §§ 83.317 and 83.319. Thus, it is necessary that some other frequency tolerance be applied. In view of our action in reducing the number of mandatorily fitted channels, we recognize that ship stations may continue to use discrete crystals to maintain transmitter frequency stability. We recognize the difficulties associated with maintaining even reasonably tight tolerances where discrete crystals are employed, particularly in older types of shipboard transmitter. Further, this situation worsens where the normal operation calls for the removal of one and insertion of a replacement crystals. Since the transmitter must be maintained within the 500 Hz channel bandwidth, we are amending section 83.131 to change the applicable frequency tolerance from 50 parts per million to 200 Hz, as set forth in the attached Appendix 1. Further, where crystal changes are employed, we encourage the installation and use aboard ship of frequency measuring devices together with oscillator adjustment capability, so that the ship station radio operator can maintain the transmitter on the assigned frequency.

10. Frequency tolerance applicable to transmitters type accepted or type approved after November 30, 1977. Specification of frequency tolerance in terms of percent of a frequency is inadequate where a uniform channel bandwidth is applied at all megacycle orders. To avoid penalty at either the low end or at the high end, the frequency tolerance applied must be related to the channel bandwidth. Since the 1974 WMARC specified a uniform channel bandwidth independent of megacycle order, we are specifying frequency tolerance in cycles per second (Hertz).

11. In recent years it has been the general practice in the industry to install a shipboard transmitter which is capable of being used for multiple types of service, for example, for A1 Morse, radiotelephony, narrow-band direct-printing and for facsimile. Frequency tolerance is not adjusted in these transmitters depending on the type of service being used. The tolerance applied is that which is designed into the transmitter and this is independent of service usage.

12. In looking at frequency tolerance for radiotelegraphy (narrow-band direct-printing), we are basically concerned that in demodulation the transmitted tones (mark and space) fall within the limits of the (receiver) filter for each tone. While standards have not yet been adopted, these filters could have a bandwidth on the order of ±35 Hz. The 1974 WMARC adopted a tolerance for narrow-band direct-printing (NB–DP) of ±15 Hz for coast stations and ±40 Hz for ship stations. Where a tone modulated suppressed carrier SSB transmitter is used, the error would be 55 Hz; the tones (mark and space) would fall outside the receiver filter bandwidth; and, thus, the NB–DP system would not function properly.

13. Where a SSB transmitter is used aboard ship for multiple service purposes, we believe it is essential that the frequency tolerance applicable to that transmitter be such that it is capable of meeting the most stringent of the service requirements. Insofar as we know, the most stringent service requirement is that of NB–DP. With a coast station frequency tolerance of ±15 Hz, receiver filter bandwidth of ±35 Hz, the shipboard frequency tolerance must be ±20 Hz. We are, therefore, adopting a frequency tolerance of ±20 Hz for transmitters type accepted or type approved after November 30, 1977, for use in the maritime mobile service on frequencies below 27.5 MHz, except as applies to survival craft station transmitters operating on 8364 kHz. In the case of survival craft station transmitters operating on 8364 kHz and type accepted or type approved after November 30, 1977, we are adopting a frequency tolerance of ±50 Hz. Selection of the value of ±50 Hz for survival craft station transmitters, after November 30, 1977, is a compromise measure responsive to the strong comments filed by AIMS and Mackay.

14. AIMS expresses the view that vessels in the domestic trade (enrolled vessels) should not be required to fit more than seven crystals, thus providing seven series of harmonically related frequencies in the 4, 6, 8, 12, and 16 MHz bands. We know of no reason nor does AIMS advance any, why vessels in the domestic trade should be treated differently from other United States vessels. It is our view that vessels in the domestic trade, as with vessels in other trades, must fit with those frequencies which are required to satisfactorily operate in the concerned maritime mobile service. By this action it is our intention to place responsibility squarely on the shoulders of the vessel operators to assure that each vessel is fitted for the use of all frequencies needed for the service of that vessel, as well as for the use of those frequencies which are needed for communication with Government and non-Government coast stations and for intership communication.

15. Collins notes that the proposed rule amendments to Part 81 do not but should include changes in frequency tolerance applicable to coast stations employing narrow-band direct-printing, in the band 4–29.7 MHz, adopted and set forth in the revised ITU Radio Regulations (see Appendix 3, note 1) and Appendix 20B, paragraph (d). Collins is correct, the referenced sections of the revised ITU Radio Regulations for the indicated bands and type of service impose a tolerance applicable to coast station equipment: of 15 Hz, where installed after January 1, 1976; of 40 Hz, where installed prior to January 1, 1976; and of 15 Hz, to all equipment after January 1, 1985. No reply comments were filed in opposition to Collins comment, or to the inclusion in Part 81 of a frequency tolerance of 15 Hz applicable to public coast radiotelegraph stations operating narrow-band direct-printing in the maritime mobile service bands between 4 and 29.7 MHz. We agree that a tolerance of 15 Hz should be made applicable to public coast radiotelegraph coast stations operating narrow-band direct-printing.

16. With regard to the matter of frequency tolerance to be applied to coast stations employing narrow-band direct-printing, it is appropriate to note that this subject was considered at length and in depth by Special Committee 64 (SC 64) of the Radio Technical Commission for Marine Services (RTCM). The final report[1] of that group was completed prior to the 1974 World Maritime Administrative Radio Conference (WMARC) and includes the following text:

"RTCM recommends that HF radioteleprinter systems provide for the following technical characteristics and operational practices:

(1) System frequency stability of transmitters and receivers should be held to within 35 Hz, nominally (25 Hz for ship and 10 Hz for coast station equipment) and not exceed 70 Hz at any time. The system stability includes receiver frequency stability, as well as transmitter frequency stability, and does not exceed permissible FCC frequency tolerances for the latter.

17. We believe that the above referenced examination by SC 64 is adequate to establish the order of magnitude of frequency tolerance which should be applied to coast stations employing radioteleprinter (narrow-band direct-printing) in the high frequency maritime bands. The results rendered by SC 64 were available to and were used by the United States Delegation at the 1974 WMARC and contributed to the decision

[1] See Final Report of RTCM Special Committee No. 64, MF, HF and VHF Maritime Radioteleprinter and Data Systems and Operation, dated June 17, 1976.

of the WMARC to apply the 15 Hz frequency tolerance in this instance. These things considered, we believe it is appropriate, therefore, to amend § 81.131 of Part 81 to apply a frequency tolerance of 15 Hz to public coast radiotelegraph stations employing narrow-band direct-printing on high frequencies in the maritime mobile service bands. Section 81.131 presently applies a frequency tolerance of 20 Hz, thus, the amendment will tighten that tolerance by 5 Hz. To provide a reasonable period for implementation, the effective date of the new tolerance (15 Hz) is delayed until January 1, 1978. The amended § 81.131 is set forth below.

18. SRS points out that when (for radioteleprinter) audio tones centered around 1,700 Hz are applied as modulation to a single sideband suppressed carrier transmitter, the residual carrier will fall outside of the authorized bandwidth and, thus, the rules require that the carrier be suppressed to the 50 microwatt level. SRS is correct in their reconstruction of the current provisions of the rules. MMR also comments on this matter. In view of the circumstances discussed in the following two paragraphs, we believe that to include the above provisions in the rules is correct, and that a change to lower the level (towards 50 milliwatts) of permitted spurious emissions would not be in the public interest.

19. The requirement for suppression to the 50 microwatt level was imposed to avoid disruption of other radioteleprinter uses of the frequencies outside the authorized bandwidth. Since the spacing between channels is uniform on a 500 Hz basis, a carrier at 1700 Hz below the assigned frequency would fall inside the channel limits of the frequency three channels lower, and if not adequately suppressed would disrupt the use of that lower channel. This situation was anticipated and considered by RTCM SC 64 during their study of HF maritime radioteleprinter and data systems. For example, some foreign administrations permit the carrier to be suppressed to the 50 milliwatt level and we have received complaints that this steady state signal (residual carrier) has and is causing disruption of radioteleprinter use of properly authorized frequencies. This situation should worsen as greater and greater use is made of the narrow-band direct-printing (NB–DP) channels. If the future usability of the NB–DP channels is to be maintained, it will be necessary at some point that other administrations increase (towards 50 microwatts) the required suppression of the residual carrier. (Further details regarding this subject are included in the Final Report of RTCM SC 64, as referred to above.)

20. We reject MMR's comment that "As an alternative to eliminate residual carrier emission interference, the 1700 hertz standard proposed on § 81.143(c)(2) is appropriate". The two requirements are not alternatives. The off-set (FSK audio tones) are permitted so that a single sideband (SSB) voice transmitter can be used, additionally, for A1 Morse and for radioteleprinter. This permits one transmitter to be used aboard ship for multiple purposes, or conversely, it nullifies the need to install two or more types of transmitters aboard ship. Technically, an A1 Morse or radioteleprinter transmitter is substantially simpler to design and produce than a SSB transmitter. Recognizing the practical and/or economic considerations involved, we accept the use of SSB transmitters for A1 Morse and radioteleprinter, however, we apply to such SSB transmitters the same technical requirements as are applicable to non-SSB A1 Morse and radioteleprinter transmitters. Neither of the two types are permitted to radiate an interfering signal on the third lower channel.

21. Further, we do not agree with MMR's statement that the two requirements are "redundant" since we have two signals, each of which must be treated. Lastly, MMR provides no factual information in support of their statement that the imposition of these two requirements "* * * would require the redesign of certain existing transmitters * * *". Insofar as we know, all of the SSB transmitters employed for radioteleprinter operations by MMR's station WLO have been type accepted by the manufacturer for 0.3 F1 emission and, thereby, meet the 50 microwatt spurious emission level requirement.

22. In paragraph 22 of the Notice of Proposed Rule Making information was requested in regard to the tuning range capability of the harmonic relationship type shipboard transmitters to cover the 25 MHz band without modification. We indicated that if extension of the tuning range was feasible, we would expect affected ship stations to have the capability to operate in the 25 MHz band. In their comments, Mackay indicates that the Radiomarine Corporation type CRM–T1A–1000M and the ITT Mackay Marine type 2013 telegraph transmitters could not be adjusted to operate in the 25 MHz band. Further, Mackay advises that the extent of modification required to extend frequency coverage to include the 25 MHz is unknown at this time. Informal information indicates that a similar situation exists with regard to the RCA Corporation ET–8065 type transmitter. CAI corrects our NPRM to wit, their type CA–35 equipment does not cover the 25 MHz band, and further advises that it is not economically feasible to retrofit the 25 MHz band in outstanding equipment.

23. On the basis of the foregoing, we believe that it would be impractical and unreasonable to require all shipboard transmitters, with particular reference to many of those now in service, to have a capability to operate in the 25 MHz band. On the other hand, we believe it is both practical and reasonable to require a capability to operate on all radiotelegraph frequencies in all bands, including the 25 MHz band, in new equipment type accepted in the future. Accordingly, this requirement is set forth in modified § 83.315(d) below.

24. Worldcom comments, in reference to paragraphs 29 through 36, of the Notice of Proposed Rule Making, that they should not be required to fit special calling receivers to guard the ship calling bands prescribed in proposed § 81.209 (a). Further, Worldcom estimates that to fit these special receivers would involve expenditures of $70,000 per station, or a total of $350,000 for all five of their public coast radiotelegraph stations.[2] The reference paragraphs do not, nor were they intended to require that Worldcom purchase new or special receivers to monitor the ship calling frequencies. We do intend that Worldcom and other licensees of public coast radiotelegraph stations shall fulfill the requirements of § 81.209 (a), (b), and (c) at each of their public coast radiotelegraph stations. It should be noted that the other public coast radiotelegraph coast station operators are faced with the same requirements as Worldcom and they have not viewed the changes imposed by the 1974 WMARC with the same apprehension expressed by Worldcom.

25. Worldcom believes that any requirement for special receivers as contemplated in section 81.209 "* * * should be deferred pending final disposition of Docket No. 19544 and the evolvement of the ultimate coast station configuration; also, that the need for such special receivers should be reviewed in the light of operational requirements under the ultimate coast station configuration when such is determined." We have disposed of the matter of "special receivers" in the foregoing paragraph. As to deferment pending final disposition of Docket No. 19544, the rules describing the technical performance capabilities of receivers used in public coast radiotelegraph stations are necessary for those stations to provide satisfactory service to ship stations on and after June 1, 1977, the date on which the new internationally agreed calling procedure will be initiated at coast stations licensed by this Commission. Where a particular difficulty is experienced in providing full service by June 1, 1977, paragraph 50, hereof, discusses a basis for obtaining short term relief.

26. In a similar vein, Worldcom's comment that the old calling procedure (whereby the calling bands are scanned) has been fully adequate to meet the service needs, can be noted as the only dissenting opinion, or as a minority opinion. It is not necessary to discuss the merits or faults of the old calling procedure, since it has been replaced by the new procedure adopted at the 1974 WMARC. That new calling procedure is now the world standard, it has been ratified by the United States and its use is mandatory.

[2] Worldcom provides no details in regard to how these figures were derived. Further, we believe that these figures far exceed the current cost for receivers of the type that will perform in consonance with the requirements of § 81.209.

27. With regard to Worldcom's understanding that the ITU Radio Regulations as adopted at the 1974 WMARC do not require receivers as described by § 81.209, we do not concur. If the United States is to fulfill the spirit and intent of the 1974 WMARC relative to the new calling procedure, and we believe this is the only means by which the advantages of the new calling procedure can be realized, it is necessary that public coast radiotelegraph stations employ receivers as described in § 81.209. Use of wideband (covering several 0.5 kHz channels) receivers, such as are now employed for the old calling procedure, will not provide the necessary technical capability to distinguish between desired and undesired signals. There was and is an urgent need to provide a calling procedure which will make it possible for a ship station to contact a coast station within a reasonable period of time. Under the old procedure, a ship station cannot determine which frequency if any, is being guarded by a coast station. The new procedure removes this major problem. Under the new procedure, a ship station knows which frequency(s) a coast station is required to guard. In the future, following reports from ship stations, if a coast station does not respond to ship station calls, we plan to ascertain the circumstances or reasons for that lack of response.

28. Collins comments that the operating procedure used on the digital selective calling frequencies, in § 81.203, should provide for the use of error control (protected) NB–DP when it is known that a ship station employs that type of terminal equipment. We are hopeful that the forthcoming 1977 meeting of CCIR will be successful in reaching semi-final agreement on the digital selective calling system to be used by the maritime mobile service and that the 1979 WARC, or more likely the maritime conference following the 1979 WARC will adopt that system into the international Radio Regulations. During the interim period, we believe it would be premature and probably would unnecessarily complicate use of the digital selective calling frequencies to provide for the use of error control ("protected") systems. That is, if we provide for the use of "protected" systems on the digital selective calling frequencies, the coast station would almost surely be forced to make its calls in both the "protected" and "unprotected" modes. Any unnecessary increase in occupancy time, by either coast or ship stations, of the digital selective calling frequencies must be avoided. We believe that the limited number of digital selective calling frequencies versus hundreds of coast stations plus over 22,000 vessels clearly demonstrates why such unnecessary use must be avoided. Ship or coast stations fitted with error control terminals are required by the international Radio Regulations and by §§ 81.143(e) and 83.143(e), hereof, to have a simple device to bypass the error control system. Accordingly, during the interim period we are not providing at United States coast stations for the use of error control ("protected") systems on the digital selective calling frequencies. Transmissions on those frequencies by ship and coast stations during the interim period shall, therefore, be in the "unprotected" mode. We will, of course, continue to monitor the international program to establish a world-wide digital selective calling system, and if circumstances so require, will revise the foregoing policy to be in accord with that program. Further, should it develop that one or more other administration(s) require that digital selective calls to its coast station(s) be made in the "protected" mode, United States vessels fitted with error control terminals should comply with that requirement.

29. Collins submits two comments in regard to proposed section 2.303, first, that the table following § 2.303(a) should include "Limited Coast (radiotelephone)"; and second, that § 2.303(b)(3) should apply to digital selective calling systems and not to sequential single-frequency code (SSFC) systems. We concur with both comments and have amended § 2,303 to be in accord therewith, as set forth in the attached Appendix.

30. Mackay suggests in regard to proposed § 83.317(h) that the endings of the tabulated frequencies (between 2089.5 and 2092.5 kHz) be in steps of not less than one hundred (100) Hz, for example, 2089.75 kHz would read 2089.7 kHz. This arrangement would permit the use of frequency synthesizers which provide incremental steps of 100 Hz. We concur with Mackay's suggestion and have amended the table of frequencies appearing in § 83.317(h), as set forth in the attached Appendix. In the revised table we have not used the 200 Hz spacing suggested by Mackay. Instead we have used a spacing of 300 Hz, except adjacent to 2,190 kHz, where a spacing of 400 Hz has been provided. The wider spacing (400 Hz) adjacent to 2,191 will provide a slightly greater protection to 2,191 kHz, which is used by some ITU Region 3 countries for safety and radionavigation purposes.

31. MMR suggests in regard to proposed § 81.143 (e) and (f), that in lieu of recognizing Automatic Repeat Request (ARQ) and Forward Error Correcting (FEC) systems we should require standardization upon the ARQ and ITU–FEC systems. MMR feels that "unprotected" radioteleprinter and other FEC systems, permitted by the proposed rules, are wasteful of both spectrum and coast station operating time and that expansion of their use should not be tolerated. Recognizing that such systems are presently in shipboard use, MMR suggests that the existing users of such systems be given "grandfather" rights. We are sympathetic to MMR's view that it is desirable to promote and enhance the growing requirement for NB–DP radiotelegraph service. Where MMR proposes that we take this opportunity to establish appropriate technical standards, we, on the other hand, feel it would be premature at this time to impose this type of standard on an infant service. In particular, we believe that to impose the mandatory fitting of error detection-correction equipment, with the sizable economic expenditure involved, could retard the growth of this service. We are, therefore, proceeding on the basis that persons desiring or requiring an improved service will fit the error detection-correction equipment as part of the initial installation; further, that if such equipment is not installed initially, it is likely that it will be installed later as the user develops a need for an improved service.

32. MMR expresses both a general and a specific dissatisfaction with proposed § 81.204(c). MMR states that § 81.204(c)

> " * * * is premature and inappropriate. The Commission has, in this subsection of the regulations, proposed codification of the frequency assignment plan in such fashion as will serve to permanently assign the frequencies without specific regard as to the public interest, convenience and necessity. It is incongruous, for example, that frequency allocations have been proposed for eight coast stations for which applications to close are presently pending before the Commission. Moreover with respect to those stations, MMR respectfully submits that if the applications to close are granted, the frequency assignments should be made available to other licensees. All too often in the past the Commission has allowed telegraphy licensees to cross-license frequencies, thus precluding, such as occurred with respect to station WAX, the opportunity for those licensees needing frequencies to obtain additional allocations, upon a showing of need and the public interest, convenience and necessity, when they become available due to closure of another station. MMR respectfully submits that the Commission must address this issue and must amend its procedures in order to provide for a more equitable distribution of the public coast station frequencies in accordance with the requirements of section 309 of the Communications Act, rather than at the private convenience of individual licensees."

33. Treating the comments of MMR in the order presented:

(a) The arrangement set forth in § 81.204(c) is neither premature or inappropriate. MMR makes no effort to substantiate or to give support to their claim. In June 1975 the staff had prepared a draft plan for the distribution of NB–DP paired frequencies between the concerned public coast radiotelegraph stations, which was then coordinated with the concerned government agencies. In July 1975 we coordinated that draft plan with the affected communication common carriers, the results of which were included in the first draft of the Notice of Proposed Rule Making (later to become Doc. No. 20813). The instant Notice of Proposed Rule Making was released June 4, 1976. In September 1976 we requested the communication common carriers to supply the basic characteristics of coast transmitting and receiving stations in order that the appropriate notices (Standard Form 128) could be supplied to the International Frequency Registration Board, pursuant to the 1974 WMARC Resolution Mar 2–7,

showing the frequencies and areas proposed to be employed at United States public coast radiotelegraph stations. That information was supplied, included on Standard Form 128 and filed with the IFRB.

MMR has not (1) in June 1975, or (2) in response to the instant proceeding, or (3) in September 1976, indicated or stated that the NB–DP frequencies proposed for station WLO were inadequate or unsatisfactory. Further, MMR has given no basis or reason for dissatisfaction with the NB–DP frequencies proposed for ITT Worldcom, RCA Globcom, or TRT Telecommunications public coast radiotelegraph stations. In fact, MMR has not clearly stated they are opposed to the NB–DP frequencies proposed for the ITT, RCA, or TRT stations. MMR's implication in the phrase "permanently assign" is true only to the extent that the rules set forth in Part 81 are permanent. As all are aware, Part 81 is frequently amended to meet changing conditions and the public need.

(b) MMR refers to the Memorandum Opinion and Order, Docket No. 19544 (FCC 76–454) released May 27, 1976 (41 FR 22059), and to applications to close eight public coast radiotelegraph stations. MMR refers, further, to § 81.204 (c), which designates frequencies for those eight stations, and expresses the view that it is "incongruous" that the Commission has proposed "frequency allocations" for those eight stations. Noting the non-final status of the referenced Memorandum Opinion and Order, the Commission will act appropriately on this matter at such time as a decision is reached to close or not to close those stations.

(c) MMR addresses the matter of cross-licensing in the vein that it precludes other licensees from access to those frequencies and uses TRT's station WAX as an example. Cross licensing has been the standard, rather than the exception, for several decades. It was initiated on a near full scale basis for communication common carrier fixed public and aeronautical fixed stations following the 1951 Extraordinary Administrative Radio Conference. In more recent years it has been applied to various maritime mobile frequency usage. In 1952 it was agreed, in meetings convened by the Commission (at which the communication common carriers and aeronautical representatives were present) on the basis that it (cross-licensing) provided the best means for protecting international registrations of United States frequency assignments and, second, as providing maximum flexibility to FCC licensees in the use of those frequencies. In the following years we know of no reversal of or desire to reverse the 1952 decision. It is our view that the 1952 decision was then, and remains today, fully in the public interest.

We turn now to MMR's reference to TRT's station WAX as an example of procedure contrary to the public interest. We suggest that one or more of the problems associated with MMR's efforts to expand its radiotelephony operations are being applied, incorrectly, to MMR's radiotelegraphy operations. Aside from the usual crowding in the coast radiotelegraph bands, we are not aware that MMR has inadequate frequencies for its radiotelegraph operations.

(d) The last reference is to MMR's comment, quoted above, that the Commission must address this issue and must amend its procedures, etc. If we correctly construe the issue referred to, it would require that we examine in detail the frequency assignments to each of the common carriers providing public coast radiotelegraph service. In the absence of a documented need for additional coast radiotelegraph frequencies by one or more of the concerned common carriers, and we know of no such need, recognizing the substantial economic burden to each carrier which would result from reaffirmation of the current procedure or development of a new procedure (for example, formal documentation of the pertinent statistics for each station, public hearings to obtain needed facts, diversion of legal, engineering and operational personnel from normal duty assignments), it is our opinion that in the absence of a documented need such action would provide no practical benefit, would serve no useful purpose, and would not be in the public interest. In any event, we do not see that Section 309 of the Communications Act is involved.

34. MMR comments that they have learned that other administrations will use the same NB–DP frequencies as proposed for United States coast stations and suggests that prior to finalization of § 81.204(c) the Commission should coordinate that plan with foreign administrations. There are over 150 foreign administrations which potentially have access to Appendix 15A frequencies and, thus, it is clear that several administrations will employ each family of the NB–DP frequencies. The need for coordination of NB–DP frequency assignments between administrations is recognized in 1974 WMARC Resolution Mar 2–7. Recognizing that a specialized conference would be required, probably following the 1979 WARC, for the maritime mobile service, the IFRB states that entries in the Master Register are being made in a manner which will not prejudice the decisions of such conference. Considering the number of United States public coast radiotelegraph stations involved, we know of no means, other than by a worldwide conference attended by using administrations, which could be employed to effect the suggested coordination. While it is our view that a coordinated plan would reduce conflicts between user administrations in the use of NB–DP frequencies, it would (1) require a reduction in the number of frequencies to which United States stations have access, and (2) require an extended period of time in which to complete. Until a clearer picture develops as to which United States and foreign stations will provide NB–DP service, we believe that the public interest is best served by proceeding on an evolutionary basis, up to the time of convening of an international maritime conference. We do not, therefore, propose to undertake any large scale international coordination with other administrations in the use of NB–DP frequencies.

35. MMR comments in regard to proposed § 81.205 that paragraph (e) appears to be in conflict with paragraphs (a) through (d) and that the section should be rearranged to initially indicate that the format detailed therein is optional rather than mandatory. MMR appears to have misunderstood the text of paragraph (e) since under the conditions stated it is of no concern to MMR or to any other coast station what format or procedure is employed. Once the coast station has patched the ship station through to the addressee, or vice versa, the transmitting station can use any procedure that station desires to use. On the other hand, except under the conditions set forth in (e), the procedure/format in paragraphs (a) through (d) is mandatory. In view thereof, we see no need to rearrange § 81.205.

36. MMR comments that the Commission should allow coast stations having A1 Morse capability to employ A1 Morse, on a secondary basis in an operational mode, for telegraphy set up and control. Further, MMR refers to MMR comments in Doc. No. 20449, which MMR states address this requirement and requests that those comments be incorporated by reference. MMR referenced comments were submitted in Doc. No. 20449 notwithstanding the Commission's statement in the Notice of Proposed Rule Making in that proceeding that the Commission would not consider the matter of use of radiotelephone frequencies to set up and back up direct-printing (radio teleprinter). MMR referenced comments in Docket No. 20449 did not refer, in any way, to the use of A1 Morse to set up a radioteleprinter circuit.

37. MMR comments that the Commission should allow, as some European administrations are doing, coast stations having A1 Morse capability to employ A1 Morse, on a secondary basis in an operational mode, for telegraphy set up and control. By "telegraphy set up" we construe MMR's reference to be to radioteleprinter set up. Proposed § 81.204(b)(6) treats this subject. In § 81.204(b)(6) we are requiring that radioteleprinter circuits be set up by radioteleprinter calls on the digital selective calling or on NB–DP frequencies. We are not authorizing the routine use of A1 Morse to set up radioteleprinter circuits, although we are providing for the interim contingency use of A1 Morse in the case where the ship or coast station may not know which NB–DP frequency(s) is to be used. We fully expect that after accurate frequency and operational information appears in ITU's Lists of Ship Stations and Coast Stations, or that information is otherwise disseminated, and the non-standard radioteleprinter systems aboard ship have been brought into accord with these rules, that the interim

contingency need for the use of A1 Morse set up will be discontinued altogether. At that time we plan to delete this interim contingency provision from proposed § 81.204(b)(6).

38. MMR requests, in regard to proposed § 81.152, that the requirements of this section be modified to permit radioteleprinter operation by a person holding a radiotelegraph third-class operator permit (T–3) or a radiotelephone third-class operator permit (P–3), when those (T–3 or P–3) operators are under the direct supervision and responsibility of an operator holding a radiotelegraph second-class operator license (T–2) or higher class of operator license. MMR states (1) that the staffing of each radioteleprinter operating postion with a T–2 technician is unnecessary; (2) creates an undue salary expense requirement; and (3) is infeasible inasmuch as a person with a T–2 operator license is overqualified merely to serve as a radioteleprinter operator. In support thereof, MMR expresses the view (4) that the requested amendment would be consistent with existing section 81.155 which allows for operation of telephony service by an unlicensed person where that person is subject to the direct supervision of a duly licensed operator; (5) corresponds to the Commission's proposed action in Docket No. 20862; and (6) is necessary to provide adequate staffing as prescribed by the Commission's Memorandum Opinion & Order (FCC 76–454) in Docket No. 19544, released May 27, 1976 (41 FR 22059, June 1, 1976). No opposing views were filed relative to MMR's request.

39. Part 13, § 13.21(f)(2) requires that an applicant (a) for a P–3 operator permit must complete tests of written examination elements 1 and 2; or (b) for a T–3 operator permit, must complete tests of written examination elements 1, 2, and 5. Element 1 covers basic law—provisions of laws, treaties, and regulations with which every operator should be familiar. Element 2 covers basic operating practice—radio operating procedures and practices generally followed or required in communicating by means of radiotelephone stations. Element 5 covers radiotelegraph operating practice—radio operating procedures and practices generally followed or required in communicating by means of radiotelegraph stations primarily other than in the maritime mobile services of public correspondence.

40. In viewing the above test elements together with the scope of authority permitted operators holding the various categories of licenses or permits, as set forth in § 13.61 (specifically § 13.61(g), in the case of class P–3, and 13.61(d) in the case of class T–3), it is not necessary to modify §§ 13.21 or 13.61 in order to effect the modifications requested by MMR. It is necessary, however, that, as requested, § 81.152 be amended. With regard to the merit of the arguments advanced by MMR in support of the requested amendment, we are persuaded that the requested amendment would facilitate the staffing and operation of public coast radiotelegraph stations. In addition, we believe that the requested amendment would not adversely affect the quality and/or capability of operating personnel at those stations. We are, therefore, amending § 81.152 to permit the operation of radioteleprinter operating positions at public coast radiotelegraph stations by personnel holding either a P–3 or a T–3 operator authorization, subject to the limitations set forth in the appropriate paragraphs of § 13.61. Section 81.152 as amended is set forth below.

41. In paragraph 28 of the Notice of Proposed Rule Making we set forth the policy which we proposed to apply to the older ship transmitters of the harmonic relationship type. That policy, modified to be in accord with the revision herein adopted, together with the applicable exceptions, is set forth below:

(a) Discontinue the availability of the type transmitters set forth below for use in ship stations after May 31, 1977; however,

(b) We will continue to license those transmitters aboard existing ship stations if the crystal oscillator section of these transmitters is modified [1] to comply with the 200 Hz frequency tolerance and to incorporate the capability to provide all A1 Morse calling and working frequencies, including those frequencies which are harmonically related and those which are not harmonically related, which are necessary to the vessels operation, provided these transmitters meet the other applicable provisions of the rules; but that

(c) We will preclude the installation of the ship transmitters set forth below (either unmodified or modified as set forth in (b), above) aboard new ships, or as replacement transmitter(s) aboard existing ships.

42. AIMS and CAI directed comments to the above policy and/or to the transmitters listed below. With regard to the matter of harmonic relationship type transmitter, AIMS expresses the view that if this type transmitter is fitted with a frequency synthesis generator (in lieu of crystals), this type transmitter should be approved for installation aboard new ships. Based on the comments filed, these transmitters will not operate in the 25 MHz band and no encouragement is given that they can be modified, practicably and on an economically feasible basis, to operate in that band. In our view, this deficiency alone provides a fully adequate basis from which to prohibit their installation on new ships. We are, therefore, rejecting AIMS request that these type transmitters be permitted to be installed on new ships. Accordingly, that portion of Appendix 2 which relates to harmonic relationship type transmitters is adopted without charge.

43. CAI's comments are directed to inclusion in Appendix 2 of their transmitter type CA–35. CAI (1) advises that they now have available a control/exciter unit that provides a capability to be set to each of the required frequencies and (2) provides with their comments a graph of power measurements for the CA–35 MKII/CL–36 showing power output variation vs. frequency and in their comments state that low power measurement may be attributable to other factors, including: malfunctioning transmitter (components or adjustments), faulty installation, an improper antenna, an improperly tuned antenna, or a lack of understanding of test parameters.

44. Based on these actions and statements by CAI, the transmitter type CA–35 has been removed from Appendix 2, which is modified in accordance therewith, and adopted as set forth in the attached Appendix. CAI is correct that it was not the Commission's intent to present the CA–35 in an unfair light to present and potential users.

45. CAI "* * * requests that there be a type acceptance requirement to measure the power output of all transmitters (affected by this proceeding) at all band-edge and mid-band frequencies. And further, that the FCC published rated power of the transmitter be determined by these measurements and shall be no more than 1 dB above the lowest recorded power in this test." We concur that CAI's request has merit since it would assure that the public was informed as to the lower output levels of the transmitter. The public would not, however, be informed as to the upper output levels. These points notwithstanding, the Commission's rules are written around the minimization of interference based on the concept of a maximum output power. Thus, there is no practical means by which CAI's suggested approach can be incorporated into the rules short of a change in concept and a major reworking of the rules. We feel that such a major undertaking is not now justified.

46. Comments were not submitted in regard to the following proposed sections and they are, accordingly, adopted without change as set forth below.

Sec.
2.106
81.184
81.203
81.206
81.207
81.209
83.133
83.134
83.143
83.155
83.156
83.318
83.319
83.320
83.321
83.324
83.328
83.329
83.330

47. In Appendix 3 to the Notice of Proposed Rule Making we provided a (27 page) listing of ship stations currently licensed for the use of radiotelegraphy. We requested licensees to inform the Commission of vessels which should be added to or deleted from that Appendix; of transmitter types in use aboard the respective vessels which differ from the

[1] These requirements could be fulfilled by the installation of a type accepted frequency synthesis generator.

listed transmitters; or of changes which should be made in other particulars deemed appropriate. The requested information was supplied, on an informal basis, by American Telephone & Telegraph Co., ITT/Mackay Marine and RCA Frequency Bureau. The information supplied has been used to update our master copy. A new master copy will be released to the public, as a separate document, it will contain specific series numbers of working frequencies and identification numbers (selective calling) for ship stations currently licensed for telegraphy. Listed ships are now authorized the use of these assignments, in conjunction with their existing station authorization.

48. In keeping with the intent of the 1974 WMARC to improve the effectiveness of the A1 Morse calling procedure by evenly distributing calls throughout the calling bands, Series No. 4 on the East coast and Series No. 11 on the West coast will be guarded by the United States Coast Guard for AMVER purposes. This action is being taken to separate public correspondence calling channels from AMVER calling channels and to establish permanent dedicated A1 Morse calling channels for the United States Coast Guard AMVER program.

49. The Commission is fully aware of the small amount of time available to put into effect the new calling procedure. Further, we are aware that the effectiveness of the Commission's Memorandum Opinion and Order on Docket No. 19544 is stayed for purposes of clarification. In view thereof, we recognize that some of the affected licensees may have difficulty in providing full service in accordance with the instant Report and Order, particularly where new, replacement, or additional equipment is involved. Accordingly, where such situation appertains, we will consider on a case by case basis, requests from affected licensees for an interim waiver of the rules in order to allow licensees to comply insofar as possible with the intent of these new rules.

50. In the Notice of Proposed Rule Making we had anticipated that changes (see paragraph 49) might be required to Part 13 to bring it into accord with consequential changes to §§ 81.152 and/or 83.159. As set forth in paragraph 41, above, no changes to Part 13 are required.

51. Any application for modification of license to comply with any rule amendments adopted herein may be submitted without a fee.

52. Accordingly, *it is ordered*, That, pursuant to the authority contained in section 303 (c), (f), (g), and (r) of the Communications Act of 1934, as amended, and in the Final Acts of the World Maritime Administrative Radio Conference, Geneva, 1974, Parts 2, 81 and 83 of the Commission's rules are amended effective July 18, 1977, as set forth in the attached Appendix.

53. *It is further ordered*, That this proceeding is terminated.

(Secs. 4, 303, 48 Stat., as amended, 1066, 1082; 47 U.S.C. 154, 303.)

FEDERAL COMMUNICATIONS COMMISSION,
VINCENT J. MULLINS,
Secretary.

Parts 2, 81, and 83 of Chapter I, Title 47, Code of Federal Regulations, are amended as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

Section 2.106 is amended to read as follows:

§ 2.106 Table of frequency allocations.

FEDERAL COMMUNICATIONS COMMISSION

Band (kHz) (7)	Service (8)	Class of station (9)	Frequency (10)	Nature (of services, of stations) (11)
*	*	*	*	*
4063 to 4143.6	Maritime mobile.	Ship		Ship (telephony, duplex).
4143.6 to 4146.6 (US82).	do	Ship		Ship.
		Coast	4145	Coast. (telephony, simplex).
4146.6 to 4162.5	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
4162.5 to 4166	do	Ship		Ship.
		Buoy		Buoy.
		Interrogating Coast.		Interrogating coast (oceanographic data transmission).
4166 to 4170	do	Ship	4168	Ship (wide-band telegraphy, facsimile and special transmission systems).
4170 to 4177.25	do	do		Ship (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
4177.25 to 4179.75	do	do		Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
4179.75 to 4187.2	do	do		Ship (calling, A1 Morse telegraphy).
4187.2 to 4188	do	do	4187.6	Ship (digital selective calling).
4188 to 4219.4	do	do		Ship (working, A1 Morse telegraphy).
4219.4 to 4349.4	do	Coast		Coast (wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct printing telegraphy systems).
4349.4 to 4356.75	do	do		Coast (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
4356.75 to 4357.4	do	do	4357	Coast (digital selective calling).
4357.4 to 4438	do	do		Coast (telephony, duplex).
*	*	*	*	*
6200 to 6218.6	do	Ship		Ship (telephony, duplex).
6218.6 to 6224.6 (US82).	do	Ship		Ship.
		Coast		Coast. (telephony, simplex).
6224.6 to 6244.5	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
6244.5 to 6248	do	Ship		Ship.
		Buoy		Buoy.
		Interrogating Coast		Interrogating Coast. (oceanographic data transmission).
6248 to 6256	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
6256 to 6267.75	do	do		Ship (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
6267.75 to 6269.75	do	do		Ship (nonpaired, narrow-band direct printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
6269.75 to 6280.8	do	do		Ship (calling, A1 Morse telegraphy).
6280.8 to 6282	do	do	6281.4	Ship (digital selective calling).
6282 to 6325.4	do	do		Ship (working, A1 Morse telegraphy).
6325.4 to 6493.9	do	Coast		Coast (wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems). (NG27)
6493.9 to 6505.75	do	do		Coast (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
6505.75 to 6506.4	do	do	6506	Coast (digital selective calling).
6506.4 to 6525	do	do		Coast (telephony, duplex).
*	*	*	*	*
8195 to 8291.1	do	Ship		Ship (telephony, duplex).
8291.1 to 8297.3 (US 82).	do	Ship		Ship.
		Coast		Coast (telephony, simplex).
8297.3 to 8300	do	Ship		Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
8300 to 8328	do	do		Ship (wide band telegraphy, facsimile and special transmission systems).
8328 to 8331.5	do	Ship		Ship.
		Buoy		Buoy.
		Interrogating coast.		Interrogating coast. (oceanographic data transmission).
8331.5 to 8343.5	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).

FEDERAL COMMUNICATIONS COMMISSION—Continued

Band (kHz) (7)	Service (8)	Class of station (9)	Frequency (10)	Nature (of services, of stations) (11)
8343.5 to 8357.25	do	do		Ship (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bands).
8357.25 to 8357.75	do	do	8357.5	Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
8357.75 to 8359.75	do	do		Ship (working, A1 Morse telegraphy).
8359.75 to 8374.4	do	do		Ship (calling, A1 Morse telegraphy).
8374.4 to 8376	do	do	8375.2	Ship (digital selective calling).
8376 to 8435.4	do	do		Ship (working, A1 Morse telegraphy).
8435.4 to 8704.4	do	Coast		Coast (wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems).
8704.4 to 8718.25	do	do		Coast (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
8718.25 to 8718.9	do	do	8718.5	Coast (digital selective calling).
8718.9 to 8815	do	do		Coast (telephony, duplex).
•	•	•	•	• • •
12330 to 12429.2	do	Ship		Ship (telephony, duplex).
12429.2 to 12439.5 (U882).	do	do		Ship.
		Coast		Coast (telephony, simplex).
12439.5 to 12479.5	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
12479.5 to 12483	do	do		Ship.
		Buoy		Buoy.
		Interrogating coast.		Interrogating coast (oceanographic data transmission).
12483 to 12491	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
12491 to 12519.75	do	do		Ship (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
12519.75 to 12526.75	do	do		Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
12526.75 to 12539.6	do	do		Ship (working, A1 Morse telegraphy).
12539.6 to 12561.6	do	do		Ship (calling, A1 Morse telegraphy).
12561.6 to 12564	do	do	12562.3 12562.8	Ship (digital selective calling).
12564 to 12652.3	do	do		Ship (working, A1 Morse telegraphy).
12652.3 to 13070.8	do	Coast		Coast (wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems).
13070.8 to 13099.75	do	do		Coast (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
13099.75 to 13100.8	do	do	13100 13100.5	Coast (digital selective calling).
13100.8 to 13200	do	do		Coast (telephony, duplex).
•	•	•	•	• • •
16460 to 16587.1	do	Ship		Ship (telephony, duplex).
16587.1 to 16596.4 (U882).	do	do		Ship.
		Coast		Coast (telephony, simplex).
16596.4 to 16636.5	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
16636.5 to 16640	do	do		Ship.
		Buoy		Buoy.
		Interrogating coast.		Interrogating Coast. (oceanographic data transmission).
16640 to 16660	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
16660 to 16694.75	do	do		Ship (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
16694.75 to 16705.8	do	do		Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
16705.8 to 16719.8	do	do		Ship (working, A1 Morse telegraphy).
16719.8 to 16748.8	do	do		Ship (calling, A1 Morse telegraphy).
16748.8 to 16752	do	do	16749.9 16750.4	Ship (digital selective calling).
16752 to 16859.4	do	do		Ship (working, A1 Morse telegraphy).
16859.4 to 17196.9	do	Coast		Coast (wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct-printing telegraphy systems).
17196.9 to 17231.75	do	do		Coast (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
17231.75 to 17232.9	do	do	17232 17232.5	Coast (digital selective calling).
17232.9 to 17360	do	do		Coast (telephony, duplex).
•	•	•	•	• • •
22000 to 22124	do	Ship		Ship (telephony, duplex).
22124 to 22139.5 (U882).	do	do		Ship.
		Coast		Coast (telephony, simplex).
22139.5 to 22160.5	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
22160.5 to 22164	do	do		Ship.
		Buoy		Buoy.
		Interrogating coast.		Interrogating coast (oceanographic data transmission)
22164 to 22192	do	Ship		Ship (wide-band telegraphy, facsimile and special transmission systems).
22192 to 22225.75	do	do		Ship (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bands).

FEDERAL COMMUNICATIONS COMMISSION—Continued

Band (kHz) (7)	Service (8)	Class of station (9)	Frequency (10)	Nature (of services, of stations) (11)
22225.75 to 22227	do	do		Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
22227 to 22247	do	do		Ship (calling, A1 Morse telegraphy).
22247 to 22250	do	do	22248 22248.5	Ship (digital selective calling).
22250 to 22310.5	do	do		Ship (working, A1 Morse telegraphy).
22310.5 to 22561	do	Coast		Coast (wide-band and A1 Morse telegraphy, facsimile, special and data transmission systems and direct printing telegraphy systems).
22561 to 22594.75	do	do		Coast (paired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
22594.75 to 22596	do	do	22595 22595.5	Coast (digital selective calling).
22596 to 22720	do	do		Coast (telephony, duplex).
•	•	•	•	•
25.01 to 25.07	Land mobile.	Base Land mobile.	25.02-25.06 (NG32)	Industrial.
25.07 to 25.76	Maritime mobile.	Ship		Ship (calling, A1 Morse telegraphy).
25.76 to 25.0901	do	do		Ship (nonpaired, narrow-band direct-printing telegraph and data transmission systems, at speeds not exceeding 100 bauds).
25.0901 to 25.11	do	do		Ship (working, A1 Morse telegraphy).
25.11 to 25.33	Land mobile.	Base Land mobile.	25.12-25.32 (NG32)	Industrial.
•	•	•	•	•

In § 2.303, the existing paragraph is amended and designated as (a) and a new paragraph (b) is added, to read as follows:

§ 2.303 Other forms of identification of stations.

(a) The following table indicates forms of identification which may be used in lieu of call signs by the specified classes of stations. Such recognized means of identification may be one or more of the following: name of station, location of station, operating agency, official registration mark, flight identification number, selective call number or signal, selective call identification number or signal, characteristic signal, characteristic of emission or other clearly distinguishing form of identification readily recognized internationally. Reference should be made to the appropriate part of the rules for complete information on identification procedures for each service.

Class of Station	*Identification, other than assigned call sign*
• •	• • •
	Ship telegraph—When an official call sign is not yet assigned; Complete name of the ship and name of licensee. On 156.65 MHz: Name of ship. Digital selective call.
Ship telepgraph	Digital selective call.
Public coast (radiotelephone) and Limited Coast (Radiotelephone).	The approximate geographic location in a format approved by the Commission. Coast station identification number.
Public coast (radiotelegraph).	Coast station identification number.
• •	• • •

(b) Digital selective calls will be authorized by the Commission and will be formed by groups of numbers (0 through 9), however, the first digit must be other than 0, as follows:

(1) Coast station identification number: 4 digits.

(2) Ship station selective call number: 5 digits.

(3) Predetermined group of ship stations: 5 digits.

PART 81—STATIONS ON LAND IN THE MARITIME SERVICES AND ALASKA-PUBLIC FIXED STATIONS

1. In § 81.131, a footnote is added to paragraph (b) (3) (ii), to read as follows:

§ 81.131 Authorized frequency tolerance.

• • • • •

(b) • • •

Frequency ranges	*Tolerance—parts in 10^6 unless shown as hertz (Hz)*
• •	• •
(3) From 4,000 to 27,500 kHz:	
(i) For A3A, A3B, A3H, and A3J emissions.	20 Hz.
(ii) For narrow-band direct-printing telegraph and data transmission system.	20 Hz[1].
(iii) For other than (i) and (ii) above.	15.

• • • • •

2. In § 81.143, paragraph (c) is amended and new paragraphs (d), (e) and (f) are added to read as follows:

§ 81.143 Narrow-band direct-printing radiotelegraph equipment.

• • • • •

(c) (1) Class F1 emission shall be used, with a total frequency shift of 170 Hertz.

(2) When frequency shift keying is effected by applying audio signals to the input of a single sideband transmitter, the suppressed (residual) carrier, when it falls outside the authorized bandwith, shall be suppressed to the level prescribed by § 81.140. Further, the center audio frequency between the ±85 Hz tones shall be 1,700 Hz, ±5 Hz, above the suppressed (residual) carrier.

(d) The higher of the emitted frequencies shall correspond to "space" (start), and the lower the emitted frequencies shall correspond to "mark" (stop).

(e) Where an error control system is employed the apparatus shall be provided with a simple device to bypass the error control system to permit transmission and reception over the radio path of uncorrected signals conforming with (a), above.

(f) When an error-detecting and correcting system is used for direct-printing telegraphy in the maritime mobile service, a 7-unit ARQ system or a 7-unit forward acting error-correcting and indicating time diversity system, using the same code, shall be employed.

3. In § 81.152, paragraph (d) is amended to read as follows:

§ 81.152 Operator required.

• • • • •

(d) *Description of Station*	*Minimum operator authorization*
Public coast telegraph, all classes.	T-2.
Coast telephone, all classes, except in Alaska:	
Exceeds 250 watts carrier power or 1,500 watts peak envelope power.	T-2 or P-2.
250 watts or less carrier power; or 1,500 watts or less peak enevelope power operating on frequencies below 30 MHz.	T-3 or P-3.
250 watts or less carrier power, or 1,500 watts or less peak envelope pow- operating on frequencies above 30 MHz.	RP.
Coast telephone, in Alaska:	
Exceeds 250 watts carrier power; or 1,500 watts peak envelope power, Class I station.	T-2 or P-2.
Exceeds 250 watts carrier power, or 1,500 watts peak envelope power, Class II or Class III station.	T-3 or P-3.
250 watts or less carrier power, or 1,500 watts or less peak envelope power, all classes.	RP.
Marine fixed, except in Alaska.	T-3 or P-3.
Marine fixed in Alaska	RP.
Marine utility coast	RP.
Shipyard base	RP.

• • • • •

4. In § 81.184, paragraphs (a) and (b) are amended and note deleted, to read as follows:

§ 81.184 Transmission of traffic lists by coast stations.

(a) Public coast stations are authorized to transmit, on their normal working frequencies in the appropriate bands,

[1] A frequency tolerance of 15 Hz is applicable effective January 1, 1978.

lists of official call signs (or, alternatively in the use of radiotelephony, the names of the respective ships), in alphabetical order insofar as practicable, of all mobile stations for which they have traffic on hand. The use of calling frequencies for this purpose is prohibited; however, coast stations may announce on a calling frequency that they are about to transmit such call lists on a specified frequency. These traffic lists shall be transmitted at intervals of:

(1) In the case of radiotelephony, at least two hours and not more than four hours during the working hours of the coast station.

(2) In the case of radiotelegraphy, at least one hour and not more than four hours during the working hours of the coast station.

(b) An announcement on a calling frequency that a coast station is about to transmit a call list on a specified working frequency shall be as brief as practicable, but in any event shall not be repeated more than twice.

5. The present section heading and text of § 81.203 is redesignated § 81.223 and a new § 81.203 is adopted to read as follows:

§ 81.203 Digital selective calling frequencies.

(a) The carrier frequencies set forth in the table below are available for use by each coast station authorized to employ frequencies in the band 4—27.5 MHz for calls to ship stations by means of digital selective calling. The associated reply frequencies are also shown.

Coast station transmit to ships (kHz): [1]	*Coast station receive from ships (kHz)* [1]
4357	4187.6
6506	6281.4
8718.5	8375.2
13100	12562.3
13100.5	12562.8
17232	16749.9
17232.5	16750.4
22595	22248
22595.5	22248.5

[1] These frequencies are available for use effective June 1, 1977.

(b) Until such time as a digital selective calling system and associated procedures have been agreed upon and adopted into the ITU Radio Regulations, coast station authorized to employ narrow-band direct-printing (NB–DP) for communication with ship stations may, effective June 1, 1977, use the frequencies designated in paragraph (a) of this section for calls to ship stations fitted for the use of narrow-band direct-printing equipment.

(c) In using the frequencies indicated for transmission, coast stations should make reasonable effort to avoid the creation of interference to other coast stations employing the same frequencies.

(d) In calling ship stations by narrow-band direct-printing, the coast station shall use the ship station selective call number (5 digits) and effect self-identification by the use of the coast station identification number (4 digits).

(e) Calls to a ship station shall employ the following format:

(1) Ship station selective call number, repeated twice;

(2) "DE", sent once; and

(3) Coast station identification number, repeated twice.

(f) When the ship station does not reply to a call sent three times at intervals of two minutes, the calling shall cease and shall not be renewed until after an interval of fifteen minutes.

6. The present section heading and text of § 81.204 is redesignated § 81.224 and a new § 81.204 is adopted to read as follows:

§ 81.204 Assignable frequencies—Narrow-band direct-printing radiotelegraph and data transmission systems.

(a) Each of the specific frequencies set forth in the following table under the column headed "coast transmit" may be licensed as an assigned frequency for use by coast stations employing narrow-band direct-printing radiotelegraphy for communication with ship stations employing the same system, subject to and in accordance with the provisions of paragraph (b) of this section and Subpart E of this part, and upon the express condition that interference shall not be caused to any service or station which, in the discretion of the Commission, may have priority on the frequency or frequencies involved: *Provided*, That the use of each of these frequencies may be restricted by the Commission to specific areas or locations in order to avoid or minimize interference between stations.

Series No.	4 MHz band		6 MHz band		8 MHz band	
	Coast transmit	Coast receive	Coast transmit	Coast receive	Coast transmit	Coast receive
1	4350	4170.5	[illegible]	[illegible]	8705	8344
2	4350.5	4171	6495	6257	8705.5	8344.5
3	4351	4171.5	[illegible]	[illegible]	8706	8345
4	4351.5	4172	6496	6258	8706.5	8345.5
5	4352	4172.5	[illegible]	[illegible]	8707	8346
6	4352.5	4173	6497	6259	8707.5	8346.5
7	4353	4173.5	[illegible]	[illegible]	8708	8347
8	4353.5	4174	6498	6260	8708.5	8347.5
9	4354	4174.5	[illegible]	[illegible]	8709	8348
10	4354.5	4175	6499	6261	8709.5	8348.5
11	4355	4175.5	6499.5	[illegible]	8710	8349
12	4355.5	4176	6500	6262	8710.5	8349.5
13	[illegible]	4176.5	6500.5	[illegible]	8711	8350
14	[illegible]	4177	[illegible]	6263	8711.5	8350.5
15			6501.5	[illegible]	8712	8351
16			6502	6264	8712.5	8351.5
17			6502.5	[illegible]	8713	8352
18			[illegible]	6265	8713.5	8352.5
19			[illegible]	6265.5	8714	8353
20			6504	6266	8714.5	8353.5
21			[illegible]	[illegible]	8715	8354
22			[illegible]	[illegible]	8715.5	8354.5
23			[illegible]	[illegible]	8716	8355
24					8716.5	8355.5
25					8717	8356
26					8717.5	8356.5
27					8718	8357

	12 MHz band		16 MHz band		22 MHz band	
	Coast transmit	Coast receive	Coast transmit	Coast receive	Coast transmit	Coast receive
1	13071.5	12491.5	17197.5	16660.5	22561.5	22192.5
2	13072	[illegible]	[illegible]	[illegible]	22562	22193
3	13072.5	12492.5	17198.5	16661.5	22562.5	22193.5
4	13073	12493	17199	16662	22563	22194
5	13073.5	12493.5	17199.5	[illegible]	22563.5	22194.5
6	13074	12494	17200	16663	22564	22195
7	13074.5	12494.5	17200.5	16663.5	22564.5	22195.5
8	13075	[illegible]	17201	16664	22565	22196
9	13075.5	[illegible]	17201.5	[illegible]	22565.5	22196.5
10	13076	12496	[illegible]	16665	22566	22197
11	13076.5	12496.5	17202.5	16665.5	22566.5	22197.5
12	13077	[illegible]	[illegible]	16666	22567	[illegible]
13	13077.5	12497.5	17203.5	16666.5	22567.5	22198.5
14	13078	12498	17204	16667	22568	22199
15	13078.5	12498.5	17204.5	[illegible]	22568.5	22199.5
16	13079	[illegible]	[illegible]	[illegible]	22569	22200
17	13079.5	12499.5	17205.5	16668.5	22569.5	22200.5
18	[illegible]	12500	17206	16669	22570	22201
19	13080.5	12500.5	[illegible]	16669.5	22570.5	22201.5
20	13081	12501	17207	16670	22571	22202
21	13081.5	12501.5	17207.5	16670.5	22571.5	22202.5
22	13082	[illegible]	[illegible]	16671	22572	22203
23	13082.5	12502.5	17208.5	16671.5	22572.5	22203.5
24	[illegible]	12503	17209	16672	22573	22204
25	13083.5	12503.5	[illegible]	16672.5	22573.5	22204.5
26	13084	12504	17210	16673	22574	22205
27	13084.5	12504.5	17210.5	16673.5	22574.5	22205.5
28	[illegible]	12505	17211	[illegible]	22575	22206
29	13085.5	12505.5	17211.5	[illegible]	22575.5	22206.5
30	13086	[illegible]	17212	16675	22576	22207
31	[illegible]	12506.5	17212.5	16675.5	22576.5	22207.5
32	13087	[illegible]	[illegible]	16676	22577	22208
33	13087.5	[illegible]	17213.5	16676.5	22577.5	22208.5
34	[illegible]	[illegible]	17214	[illegible]	22578	22209
35	13088.5	12508.5	17214.5	16677.5	22578.5	22209.5
36	[illegible]	12509	17215	16678	22579	22210
37	[illegible]	12509.5	17215.5	16678.5	22579.5	22210.5
38	[illegible]	[illegible]	[illegible]	[illegible]	22580	22211
39	[illegible]	12510.5	17216.5	[illegible]	22580.5	22211.5
40	13091	12511	17217	16680	[illegible]	[illegible]

	12 MHz band		16 MHz band		22 MHz band	
	Coast transmit	Coast receive	Coast transmit	Coast receive	Coast transmit	Coast receive
41	13091.5	12511.5	17217.5	[illegible]	22581.5	[illegible]
42	[illegible]	12512	17218	[illegible]	[illegible]	[illegible]
43	13092.5	12512.5	17218.5	16681.5	22582.5	22213.5
44	13093	12513	17219	16682	22583	22214
45	13093.5	12513.5	17219.5	16682.5	22583.5	22214.5
46	13094	12514	17220	16683	22584	22215
47	13094.5	12514.5	17220.5	16683.5	22584.5	22215.5
48	13095	12515	17221	16684	22585	22216
49	13095.5	12515.5	17221.5	16684.5	22585.5	22216.5
50	13096	12516	17222	16685	22586	22217
51	13096.5	12516.5	17222.5	16685.5	22586.5	22217.5
52	13097	12517	17223	[illegible]	22587	22218
53	13097.5	12517.5	17223.5	[illegible]	22587.5	22218.5
54	13098	12518	17224	16687	[illegible]	22219
55	13098.5	12518.5	17224.5	16687.5	22588.5	22219.5
56	13099	12519	17225	[illegible]	[illegible]	22220
57	[illegible]	12519.5	17225.5	16688.5	22589.5	22220.5
58	----------	----------	[illegible]	[illegible]	[illegible]	22221
59	----------	----------	17226.5	[illegible]	22590.5	22221.5
60	----------	----------	17227	[illegible]	[illegible]	22222
61	----------	----------	17227.5	16690.5	22591.5	22222.5
62	----------	----------	17228	16691	22592	22223
63	----------	----------	17228.5	16691.5	22592.5	22223.5
64	----------	----------	17229	16692	22593	22224
65	----------	----------	17229.5	16692.5	22593.5	22224.5
66	----------	----------	17230	16693	22594	22225
67	----------	----------	17230.5	16693.5	22594.5	22225.5
68	----------	----------	17231	16694	----------	----------
69	----------	----------	17231.5	16694.5	----------	----------

(b) The procedures set forth in this paragraph shall be used, except in cases of distress, urgency or safety, when communicating by means of narrow-band direct-printing (NB–DP) radiotelegraphy with ship stations. In that regard:

(1) Traffic may be exchanged with or without the use of error-correcting equipment.

(2) For communication between two stations, the ARQ mode should be used when available.

(3) For transmissions to two or more ship stations, the forward-error-correcting mode should be used when available.

(4) When using (paired) frequencies set forth in paragraph (a) of this section, the coast station shall receive the ship station on the frequencies, indicated in the table under "coast receive", which are paired with the frequencies used by the coast station. Cross-band operation is prohibited between coast station transmissions on frequencies listed in another section of this part and ship station transmissions on frequencies listed in paragraph (a) of this section.

(5) When receiving ship station transmissions on (non-paired) NB–DP frequencies, the coast station shall transmit on one or another of the frequencies listed in § 81.206. Special arrangements may be made between a coast station and ship stations, or shipping companies, for the use of specific frequencies.

(6) Calls to ship stations by NB–DP shall normally be made by radioteleprinter on the frequencies of § 81.203 (a), or on the NB–DP frequencies assigned to the coast station. The routine use of A1 Morse radiotelegraphy frequencies for the setting up of a NB–DP circuit is not authorized. *Provided, however,* That coast stations may, when the above alternatives are unsuccessful, call ship stations by A1 Morse radiotelegraphy, shift to A1 Morse radiotelegraphy working frequencies, and complete arrangements for setting up a NB–DP circuit.

(c) Subject to and in accordance with the provisions of paragraph (a) and (b) of this section, coast radiotelegraph stations may, upon grant of a proper application, be authorized to employ the coast transmit frequencies specified in the indicated Series No., as set forth in paragraph (a) of this section, as follows:

Call letters of coast station:	*NB–DP series No. available June 1, 1977*
KFS	1, 3, 28, 47
KHK	10, 22, 42
KLB	8, 33, 50
KLC	8, 17, 48
KOK	6, 30, 49
KPH	13, 14, 21, 22, 38
WAX	10, 15, 36
WCC	13, 14, 21, 22, 38
WLO	5, 15, 25, 54
WNU	2, 19, 52, 57
WOE	6, 21, 26, 42
WPA	9, 22, 44
WSC	9, 18, 40
WSL	1, 3, 28, 47

7. The present section heading and text of § 81.205 is redesignated § 81.225 and a new § 81.205 is adopted to read as follows:

§ 81.205 Narrow-band direct-printing (NB–DP) operating procedure.

(a) When both terminals of the NB–DP circuit are satisfied that the circuit is in operable condition, the message preamble shall be transmitted in the following format:

(1) One carriage return and one line feed,

(2) Serial number or number of the message,

(3) The name of the office of origin,

(4) The number of words,

(5) The date of handing in of the message,

(6) The time of handing in of the message, and

(7) Any service instructions. (See CCITT, Geneva 1972, Section 6 of the General provisions applying to all methods of working.)

(b) Upon completion of transmission of the preamble, the address, the text and the signature shall be transmitted as received from the sender.

(c) Upon completion of transmission of the signature, the coast station shall, following the signal "COL", routinely repeat all service indications in the address and for figures or mixed groups of letters, figures or signs in the address, text or signature.

(d) In telegrams of more than 50 words, routine repetition shall be given at the end of each page.

(e) The provisions of paragraphs (a) through (d) of this section may or not, at the discretion of the user, be utilized when a direct connection between ship station and addressee, or vice versa, is employed.

8. In § 81.206, the table following paragraph (a) is amended by the deletion and, in lieu thereof, the addition of direct replacement frequencies, as follows:

§ 81.206 Assignable frequencies.

* * * * *

Area	90–160 (kHz)	415–525 (kHz)	2 MHz (kHz)	4 MHz (kHz)	6 MHz (kHz)	8 MHz (kHz)	12 MHz (kHz)	16 MHz (kHz)	22 MHz (kHz)
Central Pacific	126.15	426	2037.5	4247	6348	8558	12695.5	17016.8	22425
		436	2045	4274	6365.5	8618	[illegible]	17025.0	22479
	147.85	460	2061.5	[illegible]	6477.5	8642	[illegible]	[illegible]	22515
		476		[illegible]		8445	[illegible]	16847.3	22557
		500							
		512					13033.5		
South Pacific		418	2049.5	4238	6355	8590	12691	17064.8	22413
		464	2055.5	[illegible]	6463.5	8606	12912	17088.8	22467
		482				8642	12993	16880.9	
		500					13033.5		
		512							
Gulf of Mexico	153.0	410	2042	4256	6369	8473	12704.5	16018.8	22431
		430	2048	4276	6435.5	8550	[illegible]	17117.6	22467
		434	2049.5	4310	[illegible]	8570	12840	17170.4	22318.5
		438	2052.5	4322	6495	8666	13038	17172.4	
		478	2055.5			8445	13051.5	16871.3	
		484	2063			8453	12660		
		500							
		512							
Great Lakes		482		4316	6474	8534			
		500							
		512							
Hawaii		484	2052.5	4295	6407.5	8542	[illegible]	16978.4	22509
		500							
		512							
Puerto Rico	153.0	486	2052.5	4244		8457	12700		
		500							
		512							
North Atlantic	112.85	418	2038	[illegible]	6351.5	8502	12745.5	[illegible]	22407
	124.05	436	2040.5	[illegible]	6376	8514	12925.5	[illegible]	22485
	130.35	442	2046.5	[illegible]	6414.5	8586	12948.0	16973.6	22503
	132.10	460	2051	4343	6418	8610	[illegible]	[illegible]	22521
	134.55	472	[illegible]	[illegible]	[illegible]	8630	12997.5	17021.6	22348.5
	137.00	476	[illegible]		6337	8658	13020.0	17093.6	22366.5
		482			6344	8686	13024.5	[illegible]	
	146.80	500					[illegible]		
	147.50	512					13060.5		
Central Atlantic		428	2063	[illegible]	6494.5	8502	12885.0		
		500							
		512							
South Atlantic	137.70	434	2039	4250	6389.65	8486	12952.5	16918.8	22431
		464	2043.5	4292	6407.5	8525	12970.5	17093.6	[illegible]
		472	2051	4295	6411	8686	13011.0	17160.8	22318.5
		488	2057			8453	12660	17170.4	
		500						16861.7	
		512							
North Pacific		482	2058.5	4349	6411	8582	12907.5	17007.2	22539
		488	2063			[illegible]	12916.5		
		500							
		512							

9. In § 81.207, paragraph (e) is amended and a new paragraph (f) is added to read as follows:

§ 81.207 Frequencies for call and reply.

* * * * *

(e) Pending availability of an internationally agreed plan for establishing two-way communications by radiotelegraph printer, the interim procedure set forth in this section may be employed until June 1, 1977.

* * * * *

(f) The frequencies set forth in the table below are available for use effective June 1, 1977, by coast radiotelegraph stations for calls to ship stations by means of digital selective calling. The associated reply frequencies are also shown.

	Coast receive from ships (kHz)
4357	4187.6
6506	6281.4
8718.5	8375.2
13100	12562.3
13100.5	12562.8
17232	16749.9
17232.5	16750.4
22595	22248
22595.5	22248.5

§ 81.208 [Redesignated]

10. The present section heading and text of § 81.208 is redesignated § 81.218 and subparagraph (d)(3) thereof is deleted.

§§ 81.208—81.214 [Redesignated]

11. The numbering of the heading and text of §§ 81.209 through 81.214 is

changed and redesignated §§ 81.219 through 81.224, as follows:

Changed from sec.:	Changed to and redesignated sec.
81.209	81.219
81.210	81.220
81.211	81.221
81.212	81.222
81.213	81.223
81.214	81.224

Area	Channel series	Kilohertz						
		4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
WAX								
WCC								
WMH	C3	4181	6271.5	8362	12543	16724	22286	25071
WOE	C5	4181.8	6272.7	8363.6	12545.4	16727.2	22282	25078
WSC	C6	4182.2	6273.3	8364.4	12546.6	16728.8	22284	25073
WSL								
WSV								
KLC								
WLO	C5	4181.8	6272.7	8363.6	12545.4	16727.2	22282	25073
WNU	C6	4182.2	6273.3	8364.4	12546.6	16728.8	22284	25072
WPA	C9	4183.4	6275.1	8366.8	12550.2	16733.6	22290	25071
WPD								
KHK								
KFS	C5	4181.8	6272.7	8363.6	12545.4	16727.2	22282	25073
KLB	C6	4182.2	6273.3	8364.4	12546.6	16728.8	22284	25072
KOK	C13	4185	6277	8370	12555	16740	22340	25075
KPH								

(b) The receiving installation employed on each designated frequency shall fulfill the following requirements:

(1) The receiving antennas provided shall be capable of effective and efficient reception of calls from ship stations on each of the designated frequencies.

(2) The transmission lines connecting antennas and receivers shall provide a minimum of attenuation of incoming signals.

(3) When more than one receiver is operated from a single antenna, means shall be provided to minimize the attenuation of incoming signals and interaction between receivers.

(c) The receivers employed shall: (1) Be capable of being accurately set to and of being reset to any one of the designated calling frequencies in each band for which the receiver is intended to operate. The time required to set or to reset the receiver to frequency shall not exceed 5 seconds.

(2) Have a selectivity capability such that it will reject signals on adjacent channels 500 Hz removed.

(3) Have a long term frequency stability of not more than 50 Hz, and shall not require recalibration more often than once each 90 days.

(4) Have a minimum sensitivity of 2 microvolts across receiver input terminals of 50 Ohms, or equivalent.

(5) Provide a power output and audio frequency response adequate to drive headphones, loudspeakers, and/or recording equipment, as necessary to meet normal station operations. The harmonic audio distortion shall not exceed five percent (5 percent) at any rated output power.

PART 83—STATIONS ON SHIPBOARD IN THE MARITIME SERVICES

1. Section 83.131, paragraph (b) is amended to read as follows:

§ 83.131 Authorized frequency tolerance.

* * * * *

(b) * * *

Frequency ranges	Tolerance, parts in 10^6 unless shown as Hz
(1) From 100 to 535 kHz:	
(i) For transmitter using A2H emission, type accepted or type approved before November 30, 1977.	50 Hz.
(ii) For transmitters using other than A2H emissions and classes of emission specified in (2) and (3), below, type accepted or type approved before November 30, 1977.	1,000.
(iii) For transmitters, type accepted or type approved after November 30, 1977.	20 Hz.
(2) From 100 to 535 kHz: Emergency transmitter only, the use of which is certified solely to safety communications or defined in § 83.6(a), type accepted or type approved:	
(i) Before November 30, 1977	3,000.
(ii) After November 30, 1977	20 Hz.
(3) Survival craft stations on 500 kHz: For transmitters, type accepted or type approved:	
(i) Before November 30, 1977	5,000.
(ii) After November 30, 1977	20 Hz.
(4) Ship stations from 1605–2070 and 2080 to 3500 kHz:	
(i) For transmitters using other than A3A, A3H, and A3J emissions, type accepted or type approved before November 30, 1977.	200.
(ii) For transmitters using A3A, A3H and A3J emissions, type accepted or type-approved before November 30, 1977.	50 Hz.
(iii) For transmitters type accepted or type approved after November 30, 1977.	20 Hz.
(5) Ship stations from 2070 to 2080 kHz: For transmitters type accepted or type approved:	
(i) Before November 30, 1977	50.
(ii) After November 30, 1977	20 Hz.
(6) Survival craft stations on 2182 kHz: For transmitters type accepted or type approved:	
(i) Before November 30, 1977	200.
(ii) After November 30, 1977	20 Hz.
(7) Stations when using frequencies within the band 4000–27500 kHz:	
(i) Ship stations using emission A1 with transmitters type accepted or type approved:	
(a) Before November 30, 1977	200 Hz.
(b) After November 30, 1977	20 Hz.
(ii) Ship stations using frequencies allotted for narrow-band direct-printing telegraph and data transmission system with transmitters type accepted or type approved:	
(a) Before November 30, 1977	50 Hz.
(b) After November 30, 1977	20 Hz.
(iii) Ship stations using A3A, A3H, or A3J emissions with transmitters type accepted or type approved:	
(a) Before November 30, 1977	50 Hz.
(b) After November 30, 1977	20 Hz.
(iv) Ship stations using emissions other than (1), (ii), or (iii), above, with transmitters type accepted or type approved:	
(a) Before November 30, 1977	50
(b) After November 30, 1977	20 Hz.
(v) Survival craft stations on 8364 kHz with transmitters type accepted or type approved:	
(a) Before November 30, 1977	200
(b) After November 30, 1977	50 Hz.

* * * * *

2. In § 83.133, the table following paragraph (a) is amended to read as follows:

§ 83.133 Authorized bandwidth.

(a) Unless otherwise specified in the station license, ship stations shall use bandwidths not exceeding those set forth in this paragraph for the respective classes of emission authorized in § 83.132.

Classes of emission	Emission designator	Authorized bandwidth (kilohertz)
A1	0.16A1	0.4
A2	2.66A2	2.8
A3	6A3	8.0
A9	3.2A9	25.0 [5]
F1	0.3F1 [1]	0.5 [1]
F3	16F3 [2]	20.0 [2]
F3	36F3 [2]	40.0 [3]
F9	2000F9	2000
P0	Variable	Variable
A3A	2.8A3A	3.0 [4]
A3H	2.8A3H	3.0 [4]
A3J	2.8A3J	3.0 [4]
A3B	5.6A3B	7.0 [4]

[1] * * *
[2] * * *
[3] * * *
[4] * * *
[5] * * *

* * * * *

3. In § 83.134, paragraph (d) is amended to read as follows:

§ 83.134 Transmitter Power.

* * * * *

(d) Other than for the frequencies specified in § 83.360 and as may be specified in the specific limitations in § 83.351, transmitter power for telephony on frequencies below 27.5 MHz shall not exceed the following values in watts:

Area	Frequency band (megahertz)	Class of emission	Transmitter power
Great Lakes area and Mississippi River north of Baton Rouge, La., and connecting inland waters.	2 to 27.5	Any	150
Other than the above	2 to 4	Ship to shore:	
		A3	[1] [2] 400
		A3H, A3A, A3J	[1] [3] 150
		Ship to ship:	
		A3	150
		A3H, A3A, A3J	150
	4 to 27.5	Any	[4] 1,500

[1] Except for distress, urgency and safety purposes the maximum power which may be used on 2170.5, 2182, and 2191 kHz is 150 W.
[2] Except for the limitation specified in footnote 1 to this table, for cargo vessels of 300 gross tons and over this value is 500 W.
[3] Except for the limitation specified in footnote 1 to this table, passenger vessels of 5,000 gross tons and over this value is 1,000 W.
[4] For passenger vessels of 5,000 gross tons and over this value is 3,000 W.

* * * * * * *

4. In § 83.143, paragraph (c) is amended and new paragraphs (d), (e) and (f) are added to read as follows:

§ 83.143 Narrow-band direct-printing radiotelegraph equipment.

* * * * *

(c) (1) Class F1 emission shall be used, with a total frequency shift of 170 Hertz.

(2) When frequency shift keying is effected by applying audio signals to the input of a single-sideband transmitter, the suppressed (residual) carrier, when it falls outside the authorized bandwidth, shall be suppressed to the level prescribed by § 83.136. Further, the center audio frequency between the ±85 Hz tones shall be 1700 Hz, ±5 Hz, above the suppressed (residual) carrier.

(d) The higher of the emitted frequencies shall correspond to "space" (start), and the lower of the emitted frequencies shall correspond to "mark" (stop).

(e) Where an error control system is employed the apparatus shall be provided with a simple device to by-pass the error control system to permit transmission and reception over the radio path of uncorrected signals conforming with (a), above.

(f) When an error-detecting and correcting system is used for direct-printing telegraphy in the maritime mobile service, a 7-unit ARQ system or a 7-unit forward acting error-correcting and indicating time diversity system, using the same code, shall be employed.

5. In § 83.155, paragraphs (d) and (e) are amended to read as follows:

§ 83.155 Operator(s) required by Title III of Communications Act of 1934.

* * * * *

(d) Each cargo ship of the United States which in accordance with Part II of Title III of the Communications Act is equipped with a radiotelephone station shall for safety purposes carry at least one qualified operator. Where the power of the station does not exceed 250 watts carrier power or 1,500 watts peak envelope power, such operator shall hold a radiotelephone third-class operator permit or higher class of operator authorization. Where the power of the station exceeds 250 watts carrier power or 1,500 watts peak envelope power, such radiotelephone second-class operator li- radiotelephone second-class oerator license.

(e) Each vessel of the United States transporting more than six passengers for hire, which in accordance with Part III of Title III of the Communications Act is equipped with a radiotelephone installation, shall for safety purposes carry at least one qualified operator. Where the power of the station does not exceed 250 watts carrier power or 1,500 watts peak envelope power, such operator shall hold a radiotelephone third-class operator permit or higher class of operator authorization. Where the power of the station exceeds 250 watts carrier power or 1,500 watts peak envelope power, such operator shall, as a minimum, hold a radiotelephone second-class operator license.

6. In § 83.156, paragraph (b) is amended to read as follows:

§ 83.156 Operator(s) required by the Safety Convention.

* * * * *

(b) Each cargo ship of the United States which is not subject to Part II of Title III of the Communications Act but which in accordance with the radio provisions of the Safety Convention is equipped with a radiotelephone station, shall for safety purposes carry at least one qualified operator. Where the power of the station does not exceed 250 watts carrier power or 1,500 watts peak envelope power such operator shall hold a radiotelephone third-class operator permit or higher class of operator authorization. Where the power of the station exceeds 250 watts carrier power or 1,500 watts peak envelope power such operator shall, as a minimum, hold a radiotelephone second-class operator license.

7. Section 83.159 is amended to read as follows:

§ 83.159 Operator requirements for non-compulsory stations.

Description of station	Minimum operator authorization
Public ship telegraph, except direct-printing, all categories	T–2
Public ship direct-printing telegraph	P–3
Public or limited ship telephone, more than 250 watts carrier power or 1,500 watts peak envelope power	P–2
Public or limited ship telephone, not more than 250 watts carrier power or 1,500 watts peak envelope power	P–3
Public or limited ship telephone, not more than 100 watts carrier power or 400 watts peak envelope power	RP
Marine utility ship	RP
Ship radiolocation-test, using radar only	[1] P–2
Ship earth station	RP

[1] With ship radar endorsement or T–2, with ship radar endorsement.

8. The present section heading and text of § 83.315 is redesignated § 83.332 and a new § 83.315 is adopted to read as follows:

§ 83.315 Authorized frequencies.

(a) The tables in §§ 83.316, 83.317, 83.318, 83.319, 83.320 and 83.321 set forth the carrier frequencies, which, when authorized by a station license may be used by ship stations employing A1 Morse or narrow-band direct-printing radiotelegraphy for communication with ship or coast stations.

(b) Frequencies available for assignment for manual Morse radiotelegraphy in the bands between 90 kHz and 27.5 MHz are designated in the respective sections, as follows:

(1) In § 83.316, ship calling and working frequencies, 90–160 and 405–535 kHz.

(2) In § 83.317, Calling frequencies, A1 Morse radiotelegraphy (C1–C18)

(3) In § 83.318, Digital selective calling frequencies.

(4) In § 83.319, Working frequencies, A1 Morse radiotelegraphy. (W1–W62)

(5) In § 83.320, Working frequencies, Narrow-band direct-printing telegraph and data transmission systems, paired. (R1–R69)

(6) In § 83.321, Working frequencies, Narrow-band direct-printing telegraph and data transmission systems, non-paired. (P1–P28)

(c) Frequencies in the bands between 2 and 27.5 MHz assigned in accordance with this section to a station or a particular vessel will be retained on the license of that station, should the station be relicensed at a later date to a different licensee.

(d) The ship station licensee shall assure that each radiotelegraph ship station authorized to employ frequencies set forth in §§ 83.317 and 83.319 shall be fitted for operation on each of those frequencies which are necessary to provide satisfactory communication over the sea routes traversed, including:

(1) Calling channel series No. 5;

(2) Calling channel series No. 6;

(3) Group calling channel(s) necessary for communication with each national and international public coast radiotelegraph station with which service is needed;

(4) The two A1 Morse working channels designated by the Commission for use by each vessel;

(5) Each group calling channel(s) necessary for communication with each Government coast station with which service is needed;

(6) Other A1 Morse working channels required for working with other ship stations and with public radiotelegraph stations with which service is needed;

(7) Other A1 Morse working channels required for working with Government coast and ship stations; and

(8) Frequencies as necessary to fulfill the safety objectives of Resolution A.283 of the Intergovernmental Maritime Consultative Organization (IMCO).

(e) The ship station licensee shall assure that each radiotelegraph ship station authorized to employ frequencies set forth in §§ 83.318, 83.320, and 83.321 shall be fitted for operation on each of those frequencies which are necessary to provide satisfactory communication over the sea routes traversed, including;

(1) Each of the narrow-band direct-printing (NB–DP) ship station frequencies which are paired with the NB–DP frequencies employed at national or international public coast radiotelegraph stations with which service is needed:

(2) Each of the NB–DP ship station frequencies which are paired with the NB–DP frequencies employed at Government coast stations with which service is needed;

(3) Each of the NB–DP ship station frequencies needed for communication with other ship stations, both Government and non-Government; and

(4) All of the digital selective calling ship station frequencies required to provide full participation with other stations of the maritime mobile service.

9. The present section heading and text of § 83.317 is redesignated § 83.333 and a new § 83.317 is adopted to read as follows:

§ 83.317 Calling frequencies—A1 Morse radiotelegraphy.

(a) Ship radiotelegraph calling frequencies in the bands between 2 and 27.5 MHz are set forth in the seven tables of this section. All of these frequencies are available to all properly authorized ship stations. In paragraphs (c) through (f) of this section the calling frequencies are arranged by Channel Series numbers. The Channel Series which is routinely guarded by coast radiotelegraph stations at United States locations is marked by appropriate footnote. The specific frequencies of the Channel Series which are guarded at a coast station will vary subject to normal propagation conditions. For vessels operating internationally, the calling frequencies which are routinely guarded at coast stations at other than United States locations can be determined by reference to the ITU publication entitled "List of Coast Stations". The world-wide plan for the distribution and use of calling frequencies appears in Appendix 15C and Resolution No. MAR 2–5 to the current edition of the ITU Radio Regulations.

(b) Each ship station licensee authorized to employ A1 More radiotelegraphy on frequencies in the maritime mobile service bands between 4 and 27.5 MHz shall provide capability to operate on the required calling frequencies from among the following:

Channel series	Band						
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
1	4180.2	6270.3	[illegible]	12540.6	16720.8	22230	25071
2	[illegible]	6270.9	[illegible]	12541.8	16722.4	[illegible]	25071
3	4181	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	25071
4	4181.4	[illegible]	[illegible]	12544.2	16725.6	[illegible]	27071
5	4181.8	6272.7	[illegible]	[illegible]	16727.2	[illegible]	25073
6	4182.2	[illegible]	[illegible]	12546.6	16728.8	[illegible]	25073
7	4182.6	[illegible]	[illegible]	12547.8	[illegible]	[illegible]	25071
8	4183	[illegible]	8366	[illegible]	16732	[illegible]	[illegible]
9	4183.4	[illegible]	[illegible]	[illegible]	[illegible]	22236	25071
10	4183.8	6275.7	[illegible]	[illegible]	[illegible]	[illegible]	25071
11	4184.2	[illegible]	[illegible]	[illegible]	16736.8	[illegible]	25075
12	4184.6	[illegible]	[illegible]	[illegible]	[illegible]	22242	25075
13	4185	[illegible]	8370	[illegible]	16740	[illegible]	25075
14	4185.4	6278.1	[illegible]	[illegible]	16741.6	22240	25075
15	4185.8	6278.7	[illegible]	12557.4	16743.2	[illegible]	25075
16	4186.2	6279.3	8372.4	[illegible]	16744.8	22246	25075
17	4186.6	6279.9	8373.2	[illegible]	16746.4	[illegible]	25075
18	4187	6280.5	8374	[illegible]	16748	22244	25075

(c) World-wide common channels:

Channel Series 5 (C5): 4181.2, 6272.7, 8363.6, 12545.4, 16727.2, 22232.0, 25073.0 kHz.[1]

Channel Series 6 (C6): 4182.2, 6273.3, 8364.4, 12546.6, 16728.8, 22234.0, 25073.0 kHz.[1]

[1] Routinely guarded by all coast radiotelegraph stations.

[2] Routinely guarded by all east coast radiotelegraph stations.

(d) East Coast:

C1 kHz	C2 kHz	C3 kHz [2]	C4 kHz
4180.2	[illegible]	4181.0	4181.4
[illegible]	6270.9	6271.5	6272.1
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	12543.0	12544.2
[illegible]	[illegible]	16724.0	16725.6
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	----------	[illegible]
25071.0	25071.0	25071.0	25071.0

(e) Gulf Coast, Puerto Rico, and Virgin Islands:

C7	C8	C9 [3]	C10
4182.6	4183.0	4183.4	4183.8
6273.9	6274.5	6275.1	6275.7
8365.2	8366.0	8366.8	8367.6
12547.8	12549.0	12550.2	12551.4
16730.4	16732.0	16733.6	16735.2
22236.0	22236.0	22236.0	22236.0
22238.0	22238.0	.....	22238.0
25071.0	25071.0	25071.0	25071.0

[3] Routinely guarded by all gulf coast radiotelegraph stations.

(f) West Coast, Guam, and Hawaii:

C11	C12	C13 [4]	C14
4184.2	4184.6	4185.0	4185.4
6276.3	6276.9	6277.5	6278.1
8368.4	8369.2	8370.0	8370.8
12552.6	12553.8	12555.0	12556.2
16736.8	16738.4	16740.0	16741.6
22242.0	22240.0	22240.0	22250.0
22242.0	22242.0	.....	22242.0
25075.0	25075.0	25075.0	25075.0

[4] Routinely guarded by all west coast radiotelegraph stations.

(g) American Samoa:

C15	C16	C17	C18
4185.8	4186.2	4186.6	4187.0
6278.7	6279.3	[5] 6279.9	6280.5
8371.6	8372.4	[5] 8373.2	8374.0
12557.4	12558.6	12559.8	12561.0
16743.2	16744.8	16746.4	16748.0
22244.0	22244.0	22244.0	22244.0
22246.0	22246.0	.....	22246.0
25075.0	25075.0	25075.0	25075.0

[5] Routinely guarded.

(h) The frequencies set forth in this paragraph are available for use by any ship station authorized to employ A1 Morse radiotelegraphy. The conditions of use are set forth in Section 83.323 (b) and (c).

Kilohertz	Kilohertz	Kilohertz	Kilohertz
2089.75	.....	2090.50	2091.75
2090	2091.25	2090.75	2092
2090.25	2091.50	2091	2092.25

(i) Initial calls by ship stations shall be made on the appropriate frequencies of Channel Series 3, 9, 13, or 17. Routinely, calls shall not be made on Channel Series 5 or 6 until after calls on the appropriate frequencies of Channel Series 3, 9, 13, or 17 have been unsuccessful.

10. The present section heading and text of § 83.318 are deleted and a new § 83.318 is added to read as follows:

§ 83.318 Digital selective calling frequencies.

(a) The frequencies set forth in the table below are available for use effective June 1, 1977, by ship stations for calls to coast radiotelegraph stations by means of digital selective calling. The associated reply frequencies are also shown.

Ship station transmit to coast (kHz):	*Ship station receive from coast (kHz)*
4187.6	4357
6281.4	6506
8375.2	8718.5
12562.3	13100
12562.8	13100.5
16749.9	17232
16750.4	17232.5
22248	22595
22248.5	22595.5

(b) When the frequencies specified in paragraph (a) of this section are used for calling by narrow-band direct-printing, the procedures set forth in § 83.329 shall be applicable.

11. The present section heading and text of § 83.319 are deleted and a new § 83.319 is adopted to read as follows:

§ 83.319 Working frequencies—A1 Morse radiotelegraphy.

(a) Ship radiotelegraph working frequencies are set forth in Tables (d) (1) through (d) (6) of this section. The first line in each Series Nos. 1–53, inclusive, indicates the harmonically related assignable carrier frequencies in the 4, 6, 8, 12, and 16 MHz bands. The other frequencies listed: in Series Nos. W1–W53 opposite (a), (b) and (c); all 22 and 25 MHz frequencies; and the frequencies indicated in Series Nos. W54–W62, inclusive, are not necessarily harmonically related.

(b) Two Series Nos. of working frequencies, for example W1 and W31, are assigned to each radiotelegraph ship station. Frequencies from the two Series Nos. assigned to each radiotelegraph ship station should be used for normal working. Other Series Nos., and frequencies therefrom, may be used by a ship station when the frequencies of the two assigned Series Nos. are not adequate.

(c) The transition by ship stations from the A1 Morse radiotelegraph working frequencies set forth in § 83.333 (H1 through H11) and § 83.335 (L1 through L49) to the working frequencies set forth in this section (W1 through W62) shall be effected in an orderly manner and shall be completed on or before May 31, 1977. During the interim period prior to June 1, 1977, both the old frequencies (§§ 83.333 and 83.335) and the new frequencies (§ 83.319) are available for use by ship stations. Effective June 1, 1977, §§ 83.333 and 83.335 are deleted.

Series No.	Bands						
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
				(d)(1)—KILOHERTZ			
W1	4188.5	[illegible]	[illegible]	12565.5	16754	22250.5	25091.5
(a)				12566	16754.5	22251	
(b)			8377.5		16755		
(c)				12566.5	16755.5		
W2	4189	6283.5	8378	12567	16756	22251.5	25092
(a)				12567.5	16756.5	22252	
(b)			8378.5		16757		
(c)				12568	16757.5		
W3	4189.5	[illegible]	8379	12568.5	16758	22252.5	25092.5
(a)				12569	16758.5	22253	
(b)			8379.5		16759		
(c)				12569.5	16759.5		
W4	4190	6285	[illegible]	12570	16760	22253.5	25093
(a)				12570.5	16760.5	22254	
(b)			8380.5		16761		
(c)				12571	16761.5		
W5	4190.5	6285.7	[illegible]	12571.5	16762	22254.5	25093.5
(a)				12572	16762.5	22255	
(b)			8381.5		16763		
(c)				12572.5	16763.5		
W6	4191	6286.5	8382	12573	16764	22255.5	25094
(a)				12573.5	16764.5	22256	
(b)			8382.5		16765		
(c)				12574	16765.5		
W7	4191.5	6287.2	8383	12574.5	16766	22256.5	25094.5
(a)				12575	16766.5	22257	
(b)			8383.5		16767		
(c)				12575.5	16767.5		
W8	4192	6288	8384	12576	16768	22257.5	25095
(a)				12576.5	16768.5	22258	
(b)			8384.5		16769		
(c)				12577	16769.5		
W9	4192.5	6288.7	8385	12577.5	16770	22258.5	25095.5
(a)				12578	16770.5	22259	
(b)			8385.5		16771		
(c)				12578.5	16771.5		
W10	4193	6289.5	8386	12579	16772	22259.5	25096
(a)				12579.5	16772.5	22260	
(b)			8386.5		16773		
(c)				12580	16773.5		
				(d)(2)—KILOHERTZ			
W11	4193.5	[illegible]	[illegible]	12580.5	16774	22260.5	25096.5
(a)				12581	16774.5	22261	
(b)			8387.5		16775		
(c)				12581.5	16775.5		
W12	4194	[illegible]	[illegible]	12582	16776	22261.5	25097
(a)				12582.5	16776.5	22262	
(b)			8388.5		16777		
(c)				12583	16777.5		

Series No.	Bands						
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
W13	4194.5	6291.7	8389	12583.5	16778	22262.5	25097.5
(a)				12584	16778.5	22263	
(b)			8389.5		16779		
(c)				12584.5	16779.5		
W14	4195	6292.5	8390	12585	16780	22263.5	25098
(a)				12585.5	16780.5	22264	
(b)			8390.5		16781		
(c)				12586	16781.5		
W15	4195.5	6293.2	8391	12586.5	16782	22264.5	25098.5
(a)				12587	16782.5	22265	
(b)			8391.5		16783		
(c)				12587.5	16783.5		
W16	4196	6294	8392	12588	16784	22265.5	25099
(a)				12588.5	16784.5	22266	
(b)			8392.5		16785		
(c)				12589	16785.5		
W17	4196.5	6294.7	8393	12589.5	16786	22266.5	25099.5
(a)				12590	16786.5	22267	
(b)			8393.5		16787		
(c)				12590.5	16787.5		
W18	4197	6295.5	8394	12591	16788	22267.5	25100
(a)				12591.5	16788.5	22268	
(b)			8394.5		16789		
(c)				12592	16789.5		
W19	4197.5	6296.2	8395	12592.5	16790	22268.5	25100.5
(a)				12593	16790.5	22269	
(b)			8395.5		16791		
(c)				12593.5	16791.5		
W20	4198	6297	8396	12594	16792	22269.5	25101
(a)				12594.5	16792.5	22270	
(b)			8396.5		16793		
(c)				12595	16793.5		

(d)(3)—KILOHERTZ

W21	4198.5	6297.7	8397	12595.5	16794	22270.5	25101.5
(a)				12596	16794.5	22271	
(b)			8397.5		16795		
(c)				12596.5	16795.5		
W22	4199	6298.5	8398	12597	16796	22271.5	25102
(a)				12597.5	16796.5	22272	
(b)			8398.5		16797		
(c)				12598	16797.5		
W23	4199.5	6299.2	8399	12598.5	16798	22272.5	25102.5
(a)				12599	16798.5	22273	
(b)			8399.5		16799		
(c)				12599.5	16799.5		
W24	4200	6300	8400	12600	16800	22273.5	25103
(a)				12600.5	16800.5	22274	
(b)			8400.5		16801		
(c)				12601	16801.5		
W25	4200.5	6300.7	8401	12601.5	16802	22274.5	25103.5
(a)				12602	16802.5	22275	
(b)			8401.5		16803		
(c)				12602.5	16803.5		
W26	4201	6301.5	8402	12603	16804	22275.5	25104
(a)				12603.5	16804.5	22276	
(b)			8402.5		16805		
(c)				12604	16805.5		
W27	4201.5	6302.2	8403	12604.5	16806	22276.5	25104.5
(a)				12605	16806.5	22277	
(b)			8403.5		16807		
(c)				12605.5	16807.5		
W28	4202	6303	8404	12606	16808	22277.5	25105
(a)				12606.5	16808.5	22278	
(b)			8404.5		16809		
(c)				12607	16809.5		
W29	4202.5	6303.7	8405	12607.5	16810	22278.5	25105.5
(a)				12608	16810.5	22279	
(b)			8405.5		16811		
(c)				12608.5	16811.5		
W30	4203	6304.5	8406	12609	16812	22279.5	25106
(a)				12609.5	16812.5	22280	
(b)			8406.5		16813		
(c)				12610	16813.5		

(d)(4)—KILOHERTZ

W31	4203.5	6305.2	8407	12610.5	16814	22280.5	25106.5
(a)				12611	16814.5	22281	
(b)			8407.5		16815		
(c)				12611.5	16815.5		
W32	4204	6306	8408	12612	16816	22281.5	25107
(a)				12612.5	16816.5	22282	
(b)			8408.5		16817		
(c)				12613	16817.5		
W33	4204.5	6306.7	8409	12613.5	16818	22282.5	25107.5
(a)				12614	16818.5	22283	
(b)			8409.5		16819		
(c)				12614.5	16819.5		
W34	4205	6307.5	8410	12615	16820	22283.5	25108
(a)				12615.5	16820.5	22284	
(b)			8410.5		16821		
(c)				12616	16821.5		
W35	4205.5	6308.2	8411	12616.5	16822	22284.5	25108.5
(a)				12617	16822.5	22285	
(b)			8411.5		16823		
(c)				12617.5	16823.5		

Series No.	Bands						
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
W36	4206	6309	8412	12618	16824	22285.5	25091.5
(a)				12618.5	16824.5	22286	
(b)			8412.5		16825		
(c)				12619	16825.5		
W37	4206.5	6309.7	8413	12619.5	16826	22286.5	25092
(a)				12620	16826.5	22287	
(b)			8413.5		16827		
(c)				12620.5	16827.5		
W38	4207	6310.5	8414	12621	16828	22287.5	25092.5
(a)				12621.5	16828.5	22288	
(b)			8414.5		16829		
(c)				12622	16829.5		
W39	4207.5	6311.2	8415	12622.5	16830	22288.5	25093
(a)				12623	16830.5	22289	
(b)			8415.5		16831		
(c)				12623.5	16831.5		
W40	4208	6312	8416	12624	16832	22289.5	25093.5
(a)				12624.5	16832.5	22300	
(b)			8416.5		16833		
(c)				12625	16833.5		
W 41	4208.5	6312.7	8417	12625.5	16834	22300.5	25094
(a)				12626	16834.5	22301	
(b)			8417.5		16835		
(c)				12626.5	16835.5		
W 42	4209	6313.5	8418	12627	16836	22301.5	25094.5
(a)				12627.5	16836.5	22302	
(b)			8418.5		16837		
(c)				12628	16837.5		
W 43	4209.5	6,314.2	8419	12628.5	16838	22302.5	25095
(a)				12629	16838.5	22303	
(b)			8419.5		16839		
(c)				12629.5	16839.5		
W 44	4210	6315	8420	12630	16840	22303.5	25095.5
(a)				12630.5	16840.5	22304	
(b)			8420.5		16841		
(c)				12631	16841.5		
W 45	4210.5	6315.7	8421	12631.5	16842	22304.5	25096
(a)				12632	16842.5	22305	
(b)			8421.5		16843		
(c)				12632.5	16843.5		
W 46	4211	6316.5	8422	12633	16844	22305.5	25096.5
(a)				12633.5	16844.5	22306	
(b)			8422.5		16845		
(c)				12634	16.45.5		
W 47	4211.5	6317.2	8423	12634.5	16846	22306.5	25097
(a)				12635	16846.5	22307	
(b)			8423.5		16847		
(c)				12635.5	16847.5		
W 48	4212	6318	8424	12636	16848	22307.5	25097.5
(a)				12636.5	16848.5	22308	
(b)			8424.5		16849		
(c)				12637	16849.5		
W 49	4212.5	6318.7	8425	12637.5	16850	22308.5	25098
(a)				12638	16850.5	22309	
(b)			8425.5		16851		
(c)				12638.5	16851.5		
W 50	4213	6319.5	8426	12639	16852	22250.5	25098.5
(a)				12639.5	16852.5	22251	
(b)			8426.5		16853		
(c)				12640	16853.5		

(d)(6)—KILOHERTZ

W 51	4213.5	6320.2	8427	12640.5	16854	22251.5	25099
(a)				12641	16854.5	22252	
(b)			8427.5		16855		
(c)				12641.5	16855.5		
W 52	4214	6321	8428	12642	16856	22252.5	25099.5
(a)				12642.5	16856.5	22253	
(b)			8428.5		16857		
(c)				12643	16857.5		
W 53	4214.5	6321.7	8429	12643.5	*16858**	22253.5	25100
(a)				12644		22254	
(b)			8429.5				
(c)				12644.5	16719		
W 54	4215	6322.5	8430	12645	16707	22254.5	25100.5
(a)				12645.5	16707.5	22255	
(b)			8430.5	12530	16708		
(c)				12646	16708.5		
W 55	4215.5	6323.2	8431	12646.5	16709	22255.5	25101
(a)				12647	16709.5	22256	
(b)			8431.5	12530.5	16710		
(c)				12647.5	16710.5		
W 56	4216	6324	8432	12648	16711	22256.5	25101.5
(a)				12648.5	16711.5	22257	
(b)			8432.5	12531	16712		
(c)				12649	16712.5		
W 57	4216.5	6324.7	8433	12649.5	16713	22257.5	25102
(a)				12650	16713.5	22258	
(b)			8433.5	12531.5	16714		
(c)				12650.5	16714.5		
W 58	4217		8434	*16851**	16715	22258.5	25102.5
(a)				12532	16715.5	22259	
(b)			8434.5	12532.5	16716		
					16716.5		
W 59	4217.5		*8435**	12528	16717	22259.5	251 03
W 60	4218		8358.5	12528.5	16717.5	22260	25103.5
W 61	4218.5		8359	12529	16718	22260.5	25104
W 62	*4219**		8359.5	12529.5	16718.5	22261	25104.5

12. The present section heading and text of § 83.320 are deleted and a new § 83.320 is adopted to read as follows:

§ 83.320 Working frequencies—narrow-band direct-printing telegraph and data transmission systems—paired.

(a) Ship radiotelegraph working frequencies—narrow-band direct-printing telegraph and data transmission systems—paired with coast station frequencies, for use in the bands between 4 and 23 MHz are set forth in paragraph (d), below. The use of these frequencies is subject to the applicable provisions of Subpart E of this Part and to §§ 83.329 and 83.330.

(b) The transition by ship stations from the narrow-band direct-printing working frequencies set forth in § 83.336 (N1 through N10) to the NB–DP working frequencies set forth in this section (R1 through R69) shall be effected in an orderly manner and shall commence June 1, 1977 and be completed on or before June 30, 1977. During the interim period prior to July 1, 1977, the old frequencies set forth in § 83.336 will be available until July 1, 1977, and the new frequencies set forth in this section will be available commencing June 1, 1977. Effective July 1, 1977, § 83.336 is deleted.

(c) The frequencies set forth in paragraph (d), below, are available for use by radiotelegraph ship stations authorized to employ narrow-band direct-printing. The ship station shall transmit to a coast station on the frequencies which are paired with the Series No. used by the coast station for transmission.

(d) The frequencies set forth in the following table are available for communication by radioteleprinter with coast stations when used in accordance with the technical criteria set forth in § 83.143 and other sections of Subpart E of this part.

Series No.	4 MHz band		6 MHz band		8 MHz band	
	Ship receive	Ship transmit	Ship receive	Ship transmit	Ship receive	Ship transmit
R1	4350	4170.5	6494.5	6256.5	8705	8344
R2	4350.5	4171	6495	6257	8705.5	8344.5
R3	4351	4171.5	6495.5	6237.5	8706	8345
R4	4351.5	4172	6496	6258	8706.5	8345.5
R5	4352	4172.5	6496.5	6258.5	8707	8346
R6	4352.5	4173	6497	6259	8707.5	8346.5
R7	4353	4173.5	6497.5	6259.5	8708	8347
R8	4353.5	4174	6498	6260	8708.5	8347.5
R9	4354	4174.5	6498.5	6260.5	8709	8348
R10	4354.5	4175	6499	6261	8709.5	8348.5
R11	4355	4175.5	6499.5	6261.5	8710	8349
R12	4355.5	4176	6500	6262	8710.5	8349.5
R13	4356	4176.5	6500.5	6262.5	8711	8350
R14	4356.5	4177	6501	6263	8711.5	8350.5
R15			6501.5	6263.5	8712	8351
R16			6502	6264	8712.5	8351.5
R17			6502.5	6264.5	8713	8352
R18			6503	6265	8713.5	8352.5
R19			6503.5	6265.5	8714	8353
R20			6504	6266	8714.5	8353.5
R21			6504.5	6266.5	8715	8354
R22			6505	6267	8715.5	8354.5
R23			6505.5	6267.5	8716	8355
R24					8716.5	8355.5
R25					8717	8356
R26					8717.5	8356.5
R27					8718	8357

	12 MHz band		16 MHz band		22 MHz band	
	Ship receive	Ship transmit	Ship receive	Ship transmit	Ship receive	Ship transmit
R1	13071.5	12491.5	17197.5	16660.5	22561.5	22192.5
R2	13072	12492	17198	16661	22562	22193
R3	13072.5	12492.5	17198.5	16661.5	22562.5	22193.5
R4	13073	12493	17199	16662	22563	22194
R5	13073.5	12493.5	17199.5	16662.5	22563.5	22194.5
R6	13074	12494	17200	16663	22564	22195
R7	13074.5	12494.5	17200.5	16663.5	22564.5	22195.5
R8	13075	12495	17201	16664	22565	22196
R9	13075.5	12495.5	17201.5	16664.5	22565.5	22196.5
R10	13076	12496	17202	16665	22566	22197
R11	13076.5	12496.5	17202.5	16665.5	22566.5	22197.5
R12	13077	12497	17203	16666	22567	22198
R13	13077.5	12497.5	17203.5	16666.5	22567.5	22198.5
R14	13078	12498	17204	16667	22568	22199
R15	13078.5	12498.5	17204.5	16667.5	22568.5	22199.5
R16	13079	12499	17205	16668	22569	22200
R17	13079.5	12499.5	17205.5	16668.5	22569.5	22200.5
R18	13080	12500	17206	16669	22570	22201
R19	13080.5	12500.5	17206.5	16669.5	22570.5	22201.5
R20	13081	12501	17207	16670	22571	22202
R21	13081.5	12501.5	17207.5	16670.5	22571.5	22202.5
R22	13082	12502	17208	16671	22572	22203
R23	13082.5	12502.5	17208.5	16671.5	22572.5	22203.5
R24	13083	12503	17209	16672	22573	22204
R25	13083.5	12503.5	17209.5	16672.5	22573.5	22204.5
R26	13084	12504	17210	16673	22574	22205
R27	13084.5	12504.5	17210.5	16673.5	22574.5	22205.5

	12 MHz band		16 MHz band		22 MHz band	
	Ship receive	Ship transmit	Ship receive	Ship transmit	Ship receive	Ship transmit
R28	13085	12505	17211	16674	22575	22205
R29	13085.5	12505.5	17211.5	16674.5	22575.5	22206.5
R30	13086	12506	17212	16675	22576	22207
R31	13086.5	12506.5	17212.5	16675.5	22576.5	22207.5
R32	13087	12507	17213	16676	22577	22208
R33	13087.5	12507.5	17213.5	16676.5	22577.5	22208.5
R34	13088	12508	17214	16677	22578	22209
R35	13088.5	12508.5	17214.5	16677.5	22578.5	22209.5
R36	13089	12509	17215	16678	22579	22210
R37	13089.5	12509.5	17215.5	16678.5	22579.5	22210.5
R38	13090	12510	17216	16679	22580	22211
R39	13090.5	12510.5	17216.5	16679.5	22580.5	22211.5
R40	13091	11511	17217	16680	22581	22212
R41	13091.5	12511.5	17217.5	16680.5	22581.5	22212.5
R42	13092	12512	17218	16681	22582	22213
R43	13092.5	12512.5	17218.5	16681.5	22582.5	22213.5
R44	13093	12513	17219	16682	22583	22214
R45	13093.5	12513.5	17219.5	16682.5	22583.5	22214.5
R46	13094	12514	17220	16683	22584	22215
R47	13094.5	12514.5	17220.5	16683.5	22584.5	22215.5
R48	13095	12515	17221	16684	22585	22216
R49	13095.5	12515.5	17221.5	16684.5	22585.5	22216.5
R50	13096	12516	17222	16685	22586	22217
R51	13096.5	12516.5	17222.5	16685.5	22586.5	22217.5
R52	13097	12517	17223	16686	22587	22218
R53	13097.5	12517.5	17223.5	16686.5	22587.5	22218.5
R54	13098	12518	17224	16687	22588	22219
R55	13098.5	12518.5	17224.5	16687.5	22588.5	22219.5
R56	13099	12519	17225	16688	22589	22220
R57	13099.5	12519.5	17225.5	16688.5	22589.5	22220.5
R58			17226	16689	22590	22221
R59			17226.5	16689.5	22590.5	22221.5
R60			17227	16690	22591	22222
R61			17227.5	16690.5	22591.5	22222.5
R62			17228	16691	22592	22223
R63			17228.5	16691.5	22592.5	22223.5
R64			17229	16692	22593	22224
R65			17229.5	16692.5	22593.5	22224.5
R66			17230	16693	22594	22225
R67			17230.5	16693.5	22594.5	22225.5
R68			17231	16694		
R69			17231.5	16694.5		

13. The present Section heading and text of § 83.321 are deleted and a new § 83.321 is adopted to read as follows:

§ 83.321 Working frequencies—narrow-band direct-printing telegraph and data transmission systems—non-paired.

(a) Ship radiotelegraph working frequencies—narrow-band direct-printing telegraph and data transmission systems—non-paired with coast station frequencies, for use in the bands between 4 and 25.5 MHz are set forth in paragraph (b), below. The frequencies are available for use by radiotelegraph ship stations authorized to employ narrow-band direct-printing and are subject to the applicable provisions of Subpart E of this Part and to §§ 83.329 and 83.330.

(b)

	Narrow-band Direct-printing—Nonpaired						
	4 MHz	6 MHz	8 MHz	12 MHz	16 MHz	22 MHz	25 MHz
P1	4177.5	6268	8297.6	12520	16695	22226	25076.3
P2	4178	6268.5	8298.1	12520.5	16695.5	22226.5	25076.8
P3	4178.5	6269	8298.6	12521	16696		25077.3
P4	4179	6269.5	8299.1	12521.5	16696.6		25077.8
P5	4179.5		8299.6	12522	16697		25078.3
P6			8357.5	12522.5	16697.5		25078.8
P7				12523	16698		25079.3
P8				12523.5	16698.5		25079.8
P9				12524	16699		25080.3
P10				15244.5	16699.5		25080.8
P11				12525	16700		25081.3
P12				12525.5	16700.5		25081.8
P13				12526	16701		25082.3
P14				12526.5	16701.5		25082.8
P15					16702		25083.3
P16					16702.5		25083.8
P17					16703		25084.3
P18					16703.5		25084.8
P19					16704		25085.3
P20					16704.5		25085.8
P21					16705		25086.8
P22					16705.5		25086.8
P23							25087.3
P24							25087.8
P25							25088.3
P26							25088.8
P27							25089.3
P28							25089.8

(c) The frequencies set forth in paragraph (b) of this section are available for use by ship stations effective July 16, 1977.

14. In § 83.324, paragraph (d) is deleted and designated "reserved"; and paragraph (e) is amended to read as follows:

§ 83.324 Frequencies for working.

* * * * *

(d) [Reserved]

(e) Working frequencies in the band 2 to 27.5 MHz are listed in § 83.319. Frequencies in the band 2065–2107 kHz are not available for assignment to aircraft.

* * * * *

15. The present section heading and text of § 83.328 are deleted and a new § 83.328 is adopted to read as follows:

§ 83.328 A1 Morse radiotelegraph operating procedure.

(a) Except for the transmission of distress or urgency signals, all transmission from stations on board ship must cease within the band 485–515 kHz during each 500 kilohertz silence period, i.e., for three minutes twice an hour beginning at x h. 15 and x h. 45, Greenwich mean time.

(b) In order to facilitate radiotelegraph communication in the maritime mobile service, all ship stations transmitting by means of telegraphy shall, whenever practicable, use the service abbreviations ("Q" signals) listed in Appendix 13A to the ITU Radio Regulations.

(c) Before transmitting a ship station shall take precautions to ensure that its emissions will not interfere with transmissions already in progress; if such interference is likely, the station shall await an appropriate break in the communications in progress. This requirement does not apply to stations where unattended operation is possible through automatic means on frequencies dedicated to narrow-band direct-printing.

(d) In order to reduce interference, ship stations shall, within the means at their disposal, endeavour to select for calling the band with the most favorable propagational characteristics for effecting reliable communication. In the absence of more precise data, a ship station shall, before making a call, listen for the signals of the station with which it desires to communicate. The strength and intelligibility of such signals are useful as a guide to propagational conditions and indicate which is the preferable band for calling.

(e) Method of calling. The call consists of: (1) The call sign of the station called, not more than twice; the word "DE"; the call sign of the calling station, not more than twice; if useful, the frequency on which the called station should reply; and the letter "k".

(2) When the calling station has more than one radiotelegram to transmit to the station called, the service abbreviation followed by the figure giving the number of such telegrams (i.e., "QTC2"), should precede the letter "k".

line feed; "DIRTLX"; telex destination

(3) For normal calling, the call may be transmitted twice at an interval of not less than one minute; thereafter it shall not be repeated until after an interval of three minutes.

(4) A ship station calling a coast station in any of the frequency bands allocated to the maritime mobile service between 4 and 27.5 MHz shall use one of the frequencies set forth in § 83.317.

(f) Method of reply. The reply to calls consists of: The call sign of the calling station, not more than twice; the word "DE"; and the call sign of the station called, once only.

(g) In addition to compliance with all applicable sections of this part, the operation of ship stations using radiotelegraphy shall comply with the applicable provisions of Article 39 of the ITU Radio Regulations.

16. The present section heading and text of § 83.329 are deleted and a new § 83.329 is adopted to read as follows:

§ 83.329 Calling by Narrow-band direct-printing.

(a) Until such time as a digital selective calling system and associated procedures have been agreed upon and adopted into the ITU Radio Regulations, ship stations employing narrow-band direct-printing (NB–DP) may, effective June 1, 1977, use the frequencies designated in § 83.318 to call United States coast radiotelegraph stations.

(b) Where it is known that the coast station maintains a watch on other frequencies for ship station calls by NB–DP, the ship station should make its initial NB–DP call on those frequencies.

(c) Calls to a coast station or other ship station shall employ the following format: Coast station identification number, repeated twice; "DE", sent once; and ship station selective call number, repeated twice.

(d) When the coast station does not reply to a call sent three times at intervals of two minutes, the calling shall cease and shall not be renewed until after an interval of fifteen minutes.

17. The present section heading and text of § 83.330 is redesignated § 83.340 and a new § 83.330 is adopted to read as follows:

§ 83.330 Narrow-band direct-printing operating procedure.

(a) The procedures set forth in this section shall be used, except in cases of distress, urgency or safety, when communicating by means of narrow-band direct-printing (NB–DP) radiotelegraphy with a coast radiotelegraph station or with other ship stations. In that regard:

(1) Traffic may be exchanged with or without the use of error-correcting equipment.

(2) For communication between two stations, the ARQ mode should be used when available.

(3) For transmissions from one coast station or ship station to two or more other stations, the forward-error-correcting mode should be used when available.

(4) Information regarding the services provided by each station open to public correspondence is indicated in the I.T.U. List of Coast Stations and in the List of Ship Stations, together with information on charging.

(b) Calls to coast stations shall normally be made by radioteleprinter on the NB–DP frequencies on which the coast station maintains a watch.

(1) The transmit frequencies and frequencies on which coast stations maintain a watch are indicated in the List of Coast Stations.

(2) When using (paired) frequencies set forth in § 83.320, the ship station shall employ the ship station frequencies paired with the frequencies in use by the coast station, that is, when the coast station employs, for example, Series No. 1, the ship station shall also employ Series No. 1. Cross-band operation between a coast station on, for example, Series No. 1 and a ship station on, for example, Series No. 14 is prohibited.

(3) When using (non-paired) frequencies set forth in § 83.321, the coast station will transmit on one of the frequencies set forth in § 81.206.

Special arrangements may be made between ship stations, or shipping companies, and coast stations for the use of specific frequencies.

(c) As an exception to the procedure specified in paragraph (b), above, under other than normal circumstances, ship stations may call coast stations on A1 Morse radiotelegraphy calling frequencies, shift to A1 Morse radiotelegraphy working frequencies, and complete arrangements for setting up a NB–DP circuit.

(1) The routine use of A1 Morse radiotelegraph frequencies for the setting up of a NB–DP circuit with United States coast stations is not authorized: *Provided, however,* That A1 Morse radiotelegraph frequencies may be used by a ship station to set up a NB–DP circuit when efforts to establish the circuit on NB–DP frequencies has proven unsuccessful.

(d) In calling the coast station by NB–DP, the ship station shall use the coast station indentification number (4 digits) and effect self-identification by the use of the ship station selective call number (5 digits).

(e) When both terminals of the NB–DP circuit are satisfied that the circuit is in operable condition, the ship station shall indicate by the following procedure, prior to transmission of the message preamble, which of two modes are to be used in the exchange of traffic:

(1) Conversational mode, where the stations concerned are connected directly either automatically or under manual control; or

(2) Store-and-forward mode, where traffic is stored at the coast station until the circuit to the called station can be set up, either automatically or under manual control.

(3) When the conversational mode is selected, this shall be supplied to the receiving station by transmission of the following: One carriage return and one code (2 or 3 numbers). (See CCITT, Geneva 1972, Annex to Recommendation F69); the land subscribers telex number; and "+", indicating end of sequence.

(4) When the store-and-forward mode is selected, this shall be supplied to the receiving station by transmission of the following: One carriage return and one line feed; "TLX"; telex destination code (2 or 3 numbers). (See CCITT, Geneva 1972, Annex to Resolution F69); the land subscribers telex number; and "+", indicating end of sequence.

(f) Following completion of the procedure set forth in subparagraphs (e) (3) or (e) (4), above, the message preamble shall be transmitted as follows: Serial number or number of the message; the name of the office of origin; the number of words; the date of handing in of the message; the time of handing in of the message; and any service instructions. (See CCITT, Geneva 1972, section 6 of the General provisions applying to all methods of working.)

(g) Upon completion of transmission of the preamble, the address, text, and signature shall be transmitted as received from the sender.

(h) Upon completion of transmission of the signature, the transmitting station shall, following the signal "COL," routinely repeat all service indications in the address and for figures or mixed groups of letters, figures, or signs in the address, text or signature.

(i) In telegrams of more than 50 words, routine repetition shall be given at the end of each page.

(j) The provisions of paragraphs (f) through (i) of this section may or not, at the discretion of the user, be utilized when a direct connection between ship station and addressee is employed.

APPENDIX 2

Effective July 18, 1977, the following type transmitters are not available for use for radiotelegraphy aboard a ship station:

(1) As a transmitter to be installed initially aboard a new ship; or

(2) As a transmitter to be installed to replace an existing transmitter.

Manufacturer	Basic type No.	Remarks
TT Mackay Marine Division, Mackay Radio & Telegraph Co.	156 167 2003 2006 2013	(1)
RCA Corp.	ET–8019 ET–8023 ET–8039 ET–8052 ET–8063 ET–8065	(1)
Radiomarine Corp.	ET–8065 CRM–T1A–1000 CRM–T1B–1000 CRM–T1C–1000	(1)

(1) A number of grants have been made for type acceptance of modifications of the basic transmitter. Each modification granted retained the basic identification number (for example 2013), but added suffix letters, or a combination of letters and numbers (for example, 2013AP, 2013AP1, 2013BP, 2013BP1, etc.). Withdrawal of authority, under the conditions specified above, is applicable to all transmitters the identification of which includes the basic type number listed. Such transmitters which were licensed and in use aboard ship prior to July 18, 1977 may continue to be used when modified to meet the frequency tolerance specified in sec. 83.131 and operate on the frequencies below 22,720 kHz as set forth in secs. 83.317 and 83.319.

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